CONSUMER VALUATION OF MEDIA AS A FUNCTION OF LOCAL MARKET STRUCTURE[1]

Final Report to the Federal Communication Commission's 2010 Quadrennial Media Ownership proceeding - MB Docket No. 09-182.

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Submitted to the Federal Communication Commission, May 30, 2011

Peer review received July 19, 2011

Final report submitted to the Federal Communication Commission, July 20, 2011

Abstract

This study examines the effects of media market structure on consumer demand and welfare. A differentiated-product model is used to estimate demand for the local media environment, described by the offerings from newspapers, radio, television, the Internet and Smartphone. Results show that the representative consumer values more different viewpoints in the reporting of information on news and current affairs, more information on community news, and more information that reflects the interests of women and minorities. Consumers have a distaste for advertising. Demand estimates are used to calculate the expected change in consumer welfare from a merger between two television stations that lowers the amount of diversity and advertising in local media environments. Welfare decreases following the merger, but these losses decrease with the number of television stations in the market. For example, the average consumer in a "small market" loses $0.11 per month, whereas the average consumer in a "large market" loses $0.04 per month. These losses are equivalent to $6 million annually for all small-market households in the U.S. and $1.4 million annually for large-market households. If the merger occurs in all markets, aggregate consumer welfare losses would be about $91 million.

Key words: differentiated product, market structure, merger, welfare

JEL Classification Number: C9, C25, L13, L82, L96

[1] The Federal Communications Commission ("FCC") provided funding for this research. We are grateful to Jessica Almond, Jonathan Levy and Tracy Waldon for their assistance during the completion of this project. Nicholas Flores, Edward Morey and Gregory Rosston provided helpful comments and contributions. Any opinions expressed here are those of the authors and not those of the FCC.

0. Executive Summary

As part of the Federal Communications Commission's ("FCC") 2010 Quadrennial Media Ownership proceeding, we have been asked to help determine consumer valuations of the localism and diversity features of their local media environment. We estimate a differentiated-product model of demand that measures consumer benefits from their local media environment. We use our demand estimates to calculate the effects on expected consumer welfare from a merger of two television stations that results in quality differences in localism and diversity between the pre- and post-merger markets. This report outlines our methodology, sample and results.

We use data from a sample of 5,131 respondents, obtained from a nationwide survey conducted in March 2011, to estimate consumer demand for their local media environment. Local media environment describes the offerings from newspapers, radio, television, the Internet and a web-enabled mobile telephone. Household data, obtained from choices in a real market and an experimental setting, are combined with a discrete-choice model to estimate the marginal willingness-to-pay (WTP) for improvements in four features of the media environment: the diversity of opinion in reporting information; the amount of information on community news and events; the coverage of multiculturalism, that is, ethnic, gender, and minority related issues; and the amount of advertising.

Respondents are presented with eight scenarios, and in each scenario, must choose between a pair of new media environment options that differ by the levels of their features. The information in these choices is enriched with market data by having respondents indicate whether they would stay with their current media environment at home or switch to the new option they had just selected. The parameters of the representative consumer's utility function, and their WTP, are then estimated from all observed choices.

Results show that diversity of opinion and community news and events are important features of the local media environment. The representative consumer is willing to pay $13 per month for more viewpoints in the reporting of information on news and current affairs, and $14 per month for more information on community news and events. Consumers also value more information that reflects the interests of women and minorities, although the WTP for this is relatively small at about $2 per month. Consumers have a distaste for advertising and are willing to pay $8 per month for a decrease in the amount of advertising in their overall media environment. Willingness-to-pay for diversity of opinion and community news increase with age, education and income, while WTP for multiculturalism decreases with age. White male consumers do not value the multiculturalism feature.

We use our demand estimates to calculate the changes to consumer welfare from a merger between two television stations that results in quality differences in localism and diversity in the pre- and post-merger markets. We conduct a simple experiment that simulates the merger by reducing the number of independent television voices in the market by one, all other things held constant. Diversity of opinion, coverage of multicultural issues, and the amount of advertising decrease following the merger. These changes in the quality of local media environments lead to welfare losses, but these losses decrease with the number of television stations in the market. For example, the average consumer in a "small market" loses $0.11 per month, whereas the average consumer in a "large market" loses $0.04 per month. These losses are equivalent to $6 million annually for all small-market households in the U.S. and $1.4 million annually for all large-market households. If the merger occurs in all markets, aggregate consumer welfare losses would be about $91 million.

1. Introduction

Two goals of U.S. media policy have been ensuring there are sufficient opportunities for different, new and independent viewpoints to be heard ("diversity"), and that media sources respond to the interests and needs of their local communities ("localism"). An interesting question is how do media ownership rules enhance diversity and localism in a way that satisfies consumers? As part of the FCC's 2010 Quadrennial Media Ownership proceeding, we have been asked to help determine consumer valuations of their local media environment. Local media environment describes household consumption of information on news and current affairs from newspapers, radio, television, the Internet, and a web-enabled mobile telephone we will call Smartphone. This report outlines a methodology that measures satisfaction by how much consumers value the diversity and localism features of their local media environment, and then calculates how these valuations vary between different market structures. We do not provide policy recommendations.

Media can be crucial for democracy.[2] Because information on news and current affairs can raise political awareness, and promote ideological diversity, many societies have charged policy makers with ensuring there are sufficient independent voices within media markets. In the U.S., the FCC has traditionally limited the amount of common ownership of radio and television stations, and the amount of cross ownership between newspapers, radio and television stations serving the same community. When ownership limits prevent market share from being concentrated around a few corporations, standard theory predicts that competition between many independent media sources can promote diversity of opinion, and incent owners to respond to the interests and needs of their local communities.

[2] Media is also important for economic development. By providing an efficient flow of information, media sources reduce transaction costs and alleviate the need for economic regulation of many sectors of the economy.

More recently, legislators and the FCC have refocused their attention on market forces, for example, consumer preferences and new media, such as satellite radio and television, the Internet, and Smartphone, in order to deliver their competition, diversity and localism goals. The Telecommunications Act of 1996 ("Act") relaxed the limit on the number of radio and television stations a firm could own nationwide, and permitted greater within-market common ownership by allowing a firm to own more local radio stations. The Act also required the FCC to review its ownership rules every four years and to "determine whether any of such rules are necessary in the public interest as the result of competition." Given the increase in choices through new media, supporters of greater ownership concentration argue that traditional media should be free to merge and use the efficiencies to provide more diverse and local programming. Opponents question whether such efficiencies are achievable, and argue that consolidated media corporations are not flexible enough to serve the interests and needs of local and minority communities.[3] Furthermore, many segments of the population to do not have access to new media and even if they did, most of the original news on the Internet, for example, is originated by newspapers, radio and television.[4] [5]

Formal evaluation of these arguments requires, among other things, measurement of the expected societal benefits that arise from increased media diversity and localism. For example, policy makers may want to use the most recent estimates of demand to measure consumer

[3] As noted by Owen and Wildman (1992), economies of scale in program distribution support the supply of non-local content. Given a fixed cost of producing news content, multiple station owners can spread these costs over more stations by distributing the same, non-locally oriented content across many communities. However, economies of scale can also support the supply of more minority content. Siegelman and Waldfogel (2001) argue that because individuals with similar tastes help defray the fixed costs of programming they all prefer, minority consumers will derive benefits from being in the same, larger market as others with similar preferences.

[4] U.S. Census Bureau (2009) data show that 64 percent of households had Internet access at the end of 2009. Data from Pew Internet and American Life surveys show that about 78 percent of adult Americans use the Internet at May, 2010 (See http://www.pewinternet.org/Static-Pages/Trend-Data/Internet-Adoption.aspx). About 24 percent of the 234 million mobile phone subscribers owned a Smartphone at August, 2010 (ComScore, 2011).

[5] During 2009, Pew Research Center (2010) monitored 53 Baltimore newspapers, radio and television stations, their associated web sites, as well as Internet-only web sites. They found that traditional media accounted for 93 percent of the original reporting or fresh information on six major news stories during the week of July 19 to 25.

satisfaction with the various features of their local media environment. Because households do not have identical preferences, they may also want to see how consumer valuations for specific media features vary with observable demographics such as age, education, gender, income, and race, and with differences in market structure. The economic construct of willingness-to-pay (WTP) can provide a theory-based, dollar measure of the value consumers place on their local media environment, as well as the amount they would be willing to pay for improvements in the individual features that comprise their environment. Since media environment is a mixture of private and public goods, indirect valuation methods, such as those used in the environmental and transportation choice literature, are appropriate.

This report uses data from a nationwide survey conducted during March 2011 to estimate a differentiated-product model of consumer demand for their local media environment. The report expands the work of Savage and Waldman (2008) and Rosston, et. al. (2010) by combining household data, obtained from choices in a real market and an experimental setting, with a well-specified discrete-choice model to estimate the marginal WTP for improvements in four local media environment features. The features are the:

- diversity of opinion in reporting information (*DIVERSITY OF OPINION*);
- amount of information on community news and events (*COMMUNITY NEWS*); and
- coverage of multiculturalism, that is, ethnic, gender, and minority related issues (*MULTICULTURALISM*); and
- amount of advertising (*ADVERTISING*).

We measure consumer satisfaction with diversity in media markets by their WTP for *DIVERSITY OF OPINION* and *MULTICULTURALISM.* We measure consumer satisfaction with local programming in media markets by their WTP for *COMMUNITY NEWS.* We

measure the full cost of their media environment by their monthly payments for media sources (*COST*) and the amount of advertising.

The empirical methodology proceeds as follows. First, we designed a survey that describes the local media environment by the offerings from newspapers, radio, television, the Internet and Smartphone. The survey was fielded on a nationally representative sample that adequately covered the range of market structures in U.S. television markets, as defined by the FCC (2011). A carefully designed choice experiment manipulates the features for a series of hypothetical media options to obtain the optimal variation in the data needed to estimate the marginal utility parameters precisely. Respondents are presented with eight choice scenarios. In each scenario, they choose between a pair of new media environment alternatives that differ by the levels of their features. The information in these choices is enriched with market data by having respondents indicate whether they would stay with their current media environment at home or switch to the new option they had just selected.

Next, we used the data from these choices and the method of maximum likelihood to estimate the structural parameters ("marginal utilities") of the representative household's utility function. These structural parameters are used to calculate consumer valuations (and WTP) for each of the various features of their media environment, and the variation in consumer valuations by demographic groups.

Finally, we used these estimated consumer valuations and government furnished information from the FCC (2011) to calculate the impact on expected consumer benefits from a change in media ownership. By relating consumer valuations of *DIVERSITY OF OPINION*, *MULTICULTURALISM*, and *COMMUNITY NEWS* to measures of market structure, we are

able to indirectly assess the extent to which ownership rules address the FCC's goals of diversity and localism.

Our empirical results show that the average price for a media environment was about $111 per month. Diversity of opinion and community news and events are important features of the local media environment. The representative consumer is willing to pay $13 per month for more viewpoints in the reporting of information on news and current affairs, and $14 per month for more information on community news and events. Consumers also value more information that reflects the interests of women and minorities (i.e., multiculturalism), although the willingness to pay for this is relatively small, about $2 per month, and is less precisely estimated. Consumers have a distaste for advertising and are willing to pay $8 per month for a decrease in the amount of space and/or time devoted to advertising in their overall media environment. Willingness-to-pay for diversity of opinion and community news increase with age, education and income, while WTP for multiculturalism decreases with age. White consumers do not value the multiculturalism feature of their local media environment. In contrast, non-white consumers are willing to pay about $5 per month for more information that reflects the interests of women and minorities. More specifically, non-white males and non-white females are willing to pay about $3.50 and $6 per month, respectively, for more information that reflects the interests of women and minorities.

Our results also suggest declining marginal utility with respect to diversity of opinion, multiculturalism and community news. The representative consumer is willing to pay about $20 per month for an improvement in diversity of opinion (or community news) from a low to a medium level defined by us in the survey (see below), but only an additional $6 to move to a high level of diversity of opinion (or community news). Consumers value an improvement in

information that reflects the interests of women and minorities from low to medium about the same as an improvement from low to high, that is, about $4 per month for each. In other words, consumers would like some multiculturalism, but are unwilling to pay for a high level when they feel they have adequate coverage.

We use our demand estimates to calculate the changes to consumer welfare from a merger between two television stations that results in quality differences in localism and diversity in the pre- and post-merger markets. We conduct a simple experiment that simulates the merger by reducing the number of independent television voices in the market by one, all other things held constant.[6] Diversity of opinion, coverage of multicultural issues, and the amount of advertising decrease following the merger. These changes in the quality of local media environments leads to welfare losses, but these losses decrease with the number of television stations in the market. For example, the average consumer in a "small market" (i.e., five television stations) loses $0.11 per month, whereas the average consumer in a "large market" (i.e., 20 television stations) loses $0.04 per month. These losses are equivalent to $6 million annually for all small-market households in the U.S. and $1.4 million annually for all large-market households. If the merger occurs in all markets, aggregate consumer welfare losses would be about $91 million.

The report is organized as follows. Section 2 reviews the previous literature. Section 3 describes the random utility model of media environment choice. The econometric method used to estimate the random utility model, calculate WTP, and to indirectly measure the value to society from a change in media market structure is contained therein. The experimental design, survey questionnaire and data are described in Section 4. Section 5 presents demand estimates and calculates consumer valuations, and Section 6 presents a merger simulation that predicts how these valuations vary between different market structures. Section 7 concludes.

[6] See page 25 and page 26 for a description of how the number of independent television voices is measured.

2. Literature Review

Numerous studies in communications, economics and political science examine the effects of technology change and ownership rules in media markets. These studies can be classified into two broad themes: new media and the information environment; and ownership, competition and the supply of programming. We review the relevant papers from these themes below.

2.1 *New media and the information environment*

Baum and Kendall (1999) present ratings data that showed the average percentage of households who watched prime-time presidential television appearances declined from 48 percent in 1969 to 30 percent in 1998. They offer two explanations for this trend; the rise of political disaffection and the growth of cable television. Using data from the National Election Study (NES), and controlling for demographics and political affection, Baum and Kendall estimate the effect of cable television on the individual's probability of viewing the 1996 presidential debate. They find that cable subscribers were less likely to have viewed the second debate by nine percentage points and conclude that because they have more viewing choices, cable subscribers with a preference for entertainment do not stay tuned to the President.

Because of the increased availability of entertainment content, Prior (2002) argued that people with a preference for entertainment now consume less political information than they used to. He uses data from the NES and Pew Media Consumption Surveys from 1996 and 2000 to examine the relationship between access to cable television and the Internet, and knowledge about congressional house incumbents. Using a logistic regression model that controls for demographics and general political knowledge, Prior finds that among people who

prefer entertainment, greater access to new media is associated with lower recall of house candidates names and their voting record.[7]

Using survey data from over 16,000 adults in the Washington, D.C. area between 2000 and 2003, Gentzkow (2007) estimated how the entry of online newspapers affected the welfare of consumers and newspaper firms. Estimates from a structural model of the newspaper market, comprising of The Washington Post's print and online versions and The Washington Times, suggest that the online and print versions of the Post are substitutes. The online newspaper reduced print readership by 27,000 per day at a cost of $5.5 million in print profits. For consumers, the entry of the online newspaper generated a per-reader surplus of $0.30 per day, equivalent to about $45 million in annual consumer welfare.

Byerly et. al. (2006) interviewed 196 subjects in the D.C. area during 2006 to investigate the consumption of news by minorities. They found that commercial television news and newspapers were the most important sources of local news and information, while radio and the Internet were among the least important. Subjects who identified the Internet as a new media source indicated that it was a supplement to other traditional media, rather than a sole source of news. The most popular preferences for important media sources were "completeness of information" and "a stronger focus on local issues with a minority angle."

Nielson Media Research (NMR) and Pew Internet and American Life provide results from periodic surveys of large numbers of households that provide a timeline for studying consumer preferences and new technologies in media markets. For example, NMR (2007) surveyed over 100,000 households during May and June, 2007 to find out how they get their news and information. They found that new media, such as cable television and the Internet,

[7] Relative entertainment preference is entertainment viewing (i.e., average daily viewing of various combinations of Jeopardy, Wheel of Fortune, Dr. Quinn, Medicine Women, Entertainment Tonight, Hardcopy, and MTV) as a share of entertainment plus news viewing (i.e., average daily viewing of local national news).

have made substantial inroads into traditional media's market share. Cable news channels, such as CNN and MSNBC, were the most important household sources for breaking news, in-depth information on specific news and current affairs, and national news, while the Internet was the second most important source for in-depth information on specific news and current affairs. Broadcast television stations, such as ABC, and local newspapers remain the most important sources of local news and current affairs.

Purcell (2011) provided survey results from 2,251 households that show that almost half of all American adults get at least some of their local news and information on their cellphone or tablet computer. Compared with other adults, these mobile local news consumers are younger, have higher income, live in urban areas, and tend to be parents of minor children. One-quarter of mobile local news consumers report having an "app" that helps them get information about their local community. Because local app users also indicate they are not necessarily more interested in general or local news than other adults, these findings suggest that the convenience of mobile online news consumption, rather than quantity, is an important aspect of their preferences.

2.2 *Ownership, competition and programming*

An alternative theme in the literature focuses on the effects of market structure, as measured by media ownership and market competition, on the quantity and quality of information supplied by newspapers, radio and television stations. Dubin and Spitzer (1993) investigate the relationship between minority ownership and radio station format. Using a cross section of stations at 1987, they find that minority-owned stations are more likely to broadcast minority-targeted programming than white-owned stations. However, they are

unable to show whether minority ownership increased the total available amount of minority-targeted programming or replaced an equivalent amount of white-owned, minority-targeted programming. Siegelman and Waldfogel (2001) control for this "crowding out" effect with a cross section of 244 radio markets at 1993 and 1997. They find that minority ownership increased the net amount of minority-targeted programming. Even though most minority-targeted stations are white-owned, markets with more minority-owned stations also have more minority-targeted stations, which means that minority-owned stations added to the total programming available to minority listeners.

Alexander and Brown (2004) estimate the impact of local ownership on the provision of local stories during each television station's half-hour local news broadcast. News is defined as local when the story takes place in the station's television market, and the mean consumer in the market perceives the story as local relative to consumers in other markets. Using data from 275 stations during 1998, their ordinary least squares (OLS) estimates show that stations with their headquarters located within the television market ("local ownership") provide about five and a half more minutes of local news, and over three more minutes of local on-location news.[8] They suggest that because they have lower costs of monitoring local events and personnel, local owners can efficiently cover more local news.

Yan and Napoli (2006) examine how market structure affects the provision of local public affairs programming. They use a two-week sample of the schedules from 285 television stations in 2003, provided by Tribune Media Services (TMS), to calculate the minutes of local programming provided by each station. Because some stations never provide local programming, while others provide none during the sample period, they estimate a zero-

[8] Using time-series, cross-section station data from 2002 to 2005, Shiman (2007) obtains a similar result for total scheduled news and public affairs programming. Among other things, he finds that TV stations owned by a big four network provided 13 percent more news programming.

inflated negative binomial model. The model relates local programming to station controls, the number of television stations in the market, whether the station is commercial, private or public, and several measures of ownership (e.g., affiliation with one of the big four networks, national audience share). Market competition did not correlate with the quantity of local programming. They concluded that increased competition is unlikely to force individual stations to provide more local programming and that commercial broadcasters are more likely to cede that programming to their public counterparts.

Crawford (2007) employs TMS data from 2004 to 2006 to analyze the relationship between the ownership of television stations and the quantity and quality of their programming. His sample is comprised of 1,479 stations, for each of the three years, from 27 broadcast networks and 192 cable networks. Quantity was measured by the number of minutes supplied in each of the following categories: local news and public affairs; minority; children; family; indecent; violent; and religious. Quality was measured by the number of minutes of advertising included in the programming.[9] Crawford estimates several econometric specifications that relate quantity and quality to local ownership, whether the parent corporation of the television station also owned a newspaper or radio station within the same market, and various other firm and market controls. Two interesting findings are that newspaper cross-owned stations provide more local news, and that ownership has no economic effect on advertising.

Milyo (2007) examined the effects of newspaper and radio cross ownership on the quantity and quality of local content for late-evening local television news during early November, 2006. Using data from 104 stations for 27 markets, and controlling for station characteristics, his within-market estimates show that newspaper cross-owned stations supply

[9] TMS provided data on every channel in the U.S., along with the "program type" and "category" fields that were used to classify the programming into the seven types. Data on the number and length of advertisements in each program were obtained from TNS.

about seven to ten percent more local news than non-cross-owned stations. On average, cross-owned stations also provide about 25 percent more coverage of state and local politics. He found no difference in quality between cross-owned stations and other major network-affiliated stations in the same market, where quality is measured by political slant, although there is evidence that the slant of local news is associated with voting preferences.[10] Because supply has increased without loss of quality, Milyo suggests that market forces, specifically consumer preferences and economies of scope, are driving station's decisions on local news coverage.

Chipty (2007) studied the effects of consolidation on non-music programming for commercial radio stations and found that more concentrated markets are associated with less program variety. Using market- and station-level data from 2005, she estimates several empirical models of the number of formats offered and format concentration.[11] Chipty shows that more concentrated markets have less "pile-up" of stations on individual formats, and large national radio owners offer more formats and have less pile up. Consolidation also affects the composition of non-music programming, with owners of multiple local stations offering longer, uninterrupted blocks of sports programming in the evening.

Using panel data from 1998 to 2001, Sweeting (2010) investigated the impact of within- and between-market common ownership on programming and listeners for 1,095 contemporary music radio stations.[12] He found that commonly-owned stations within the same market and music category differentiate their respective playlists by up to 20 percent and gain listeners.

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[10] Slant is measured by the speaking time allowed to candidates of either party, candidate coverage, partisan issue coverage, and opinion polls favoring one party or the other.

[11] Edision Media Research characterized the formats as: advertising; announcements; dead air/unknown; entertainment; leisure or DJ banter; fundraising and charity; music; news; other; public affairs; religious (non-music); sports; and static/interference.

[12] Several papers have used the variation in ownership rules from the Act to examine whether common ownership increased aggregate radio variety. Berry and Waldfogel (2001) compared the number of formats before and after the Act, and find that common ownership increased variety. The FCC (2001),with an alternative format classification, and Chambers (2003), with a cross section of playlist data, find evidence that common ownership did not increase variety.

Such differentiation makes their stations more like rivals, who lose a similar amount of listeners. Cross-market common ownership results in some homogenization of programming, which is consistent with a common owner enjoying economies of scope in offering similar programming in different markets. Because stations owned by large national corporations have been able to play more commercials without losing listeners, Sweeting suggests that homogenization has increased quality as these companies use information from different markets to identify which songs appeal to listeners. In effect, competition for listeners provide stations with strong incentives to serve local preferences.

Gentzkow and Shaprio (2010) focus on how newspapers dedifferentiate themselves with political slant. They construct an index of slant that measures the similarity of a newspaper's language to that of a congressional Republican or Democrat. Using a sample of 433 newspapers at 2005, and measuring market structure at the zip code level, they estimate a model of newspaper demand and supply that accounts for slant and newspaper owner ideology. Ideology is measured by the share of each newspaper firm's total political contributions going to Republicans. They find that readers have a preference for like-minded news, and that firms respond to market forces by slanting their news towards preferences. By contrast, the identity of the newspaper's owner explains less variation in slant. They conclude that ownership diversity may not be an important precondition for ideological diversity in the media.

2.3 *Summary*

Previous studies provide insights on consumer preferences for information on news and current affairs, the quantity and quality of the information provided in the market, and how the provision of information is affected by new media, ownership and market competition. Most of

these studies were based on data obtained prior to 2007, and most focus on measuring programming outcomes for one on the media sources that comprise the local media environment: newspaper, radio, television, the Internet, or Smartphones. Moreover, because they employ a wide range of collinear market structure variables, many of the studies are unable to identify any systematic effects from cross ownership and market competition.

This report uses the methodology described by Savage and Waldman (2008) and Rosston, et. al. (2010), and survey data obtained during March, 2011 to estimate consumer valuations for improvements in the *DIVERSITY OF OPINION*, *MULTICULTURALISM* and *COMMUNITY NEWS* features of their local media environment. A new measure of market structure is defined that counts the number of independent television voices within the market. By investigating how estimated consumer valuations vary with the number of independent voices in the market, the report helps shed light on the question of how media ownership rules and merger guidelines enhance diversity and localism in a way that satisfies consumers.

3. Methodology

3.1. *Research Questions*

We specify a relevant performance metric with respect to the FCC's diversity and localism goals, and then analyze the impact of differences in media market structure on the performance metric. Our performance metric for consumer satisfaction with diversity in media markets is their willingness-to-pay for *DIVERSITY OF OPINION* and *MULTICULTURALISM*. Our performance metric for consumer satisfaction with local programming in media markets is their willingness-to-pay for *COMMUNITY NEWS*. The questions of interest are:

i. what are consumers willing to pay for their local media environment features, *DIVERSITY OF OPINION*, *MULTICULTURALISM* and *COMMUNITY NEWS*;

ii. how does WTP vary between different demographic groups; and

iii. how does WTP vary between different market structures?

A two-step approach is employed to answer the research questions. Step one will estimate consumer demand and valuations for marginal improvements in the localism and diversity features with choice data. Step two will estimate how a hypothetical merger between two television stations affects the market's provision of the diversity and localism features of media environment alternatives. Expected consumer benefits are calculated from the difference in their valuations for media environment alternatives provided before and after the merger.

3.2 *Estimating Consumer Valuations*

The random utility model is used to estimate marginal utilities and calculate WTP. Survey respondents are assumed to maximize their household's utility of the media environment option A or B conditional on all other consumption and time allocation decisions. A linear approximation to the household conditional utility function is:

$$U^* = \beta_1 COST + \beta_2 DIVERSITY\ OF\ OPINION + \beta_3 COMMUNITY\ NEWS + \beta_4 MULTICULTURALISM + \beta_5 ADVERTISING + \varepsilon \quad (1)$$

where U^* is utility, β_1 is the marginal disutility of *COST*, β_2, β_3 and β_4 are the marginal utilities for the media environment features *DIVERSITY OF OPINION*, *COMMUNITY NEWS* and *MULTICULTURALISM*, β_5 is the marginal disutility of *ADVERTISING*, and ε is a random disturbance. Table 1 describes the levels of the features that comprise the media environments, A and B. *COST* is the dollar amount the household pays per month for their home media

environment. That is, the total of monthly subscriptions to all media sources, plus any contributions to public radio or public TV stations. *DIVERSITY OF OPINION* is the extent to which the information on news and current affairs in the household's overall media environment reflects different viewpoints. *COMMUNITY OF NEWS* is the amount of information on community news and events in the household's overall media environment. *MULTICULTURALISM* is the amount of information on news and current affairs in the household's overall media environment that reflects the interests of women and minorities. *ADVERTISING* is the amount of space and/or time devoted to advertising in the household's overall media environment.

The marginal utilities have the usual partial derivative interpretation; the change in utility, or, satisfaction, from a one-unit increase in the level of the feature. Given "more is better", our *a priori* expectation for *DIVERSITY OF OPINION*, *COMMUNITY NEWS* and *MULTICULTURALISM* is $\beta_2, \beta_3, \beta_4 > 0$. For example, an estimate of $\beta_2 = 0.2$ indicates that a one unit improvement in *DIVERSITY OF OPINION*, measured by a discrete improvement from "Low = 1" to "Medium = 2", increases utility by 0.2 for the representative household. A higher cost and a higher amount of advertising provide less satisfaction so β_1, and $\beta_5 < 0$ are expected.

Since the estimates of marginal utility, such as an increase in utility of 0.2 described above, do not have a understandable metric, it is convenient to convert these changes into dollars. This is done by employing the economic construct of willingness-to-pay. For example, the WTP for a one unit increase in *DIVERSITY OF OPINION* (*i.e.*, the discrete improvement from "Low" to "Medium") is defined as how much more the local media environment would have to be priced to make the consumer just indifferent between the old

(cheaper but with only one viewpoint) media environment and the new (more expensive but with a few different viewpoints) media environment:

$$\beta_1 COST + \beta_2 DIVERSITY\ OF\ OPINION + \beta_3 COMMUNITY\ NEWS$$
$$+ \beta_4 MULTICULTURALISM + \beta_5 ADVERTISING + \varepsilon =$$
$$\beta_1(COST + WTP_D) + \beta_2(DIVERSITY\ OF\ OPINION + 1) + \beta_3 COMMUNITY\ NEWS$$
$$+ \beta_4 MULTICULTURALISM + \beta_5 ADVERTISING + \varepsilon \qquad (2)$$

where WTP_D is the willingness-to-pay for an improvement in *DIVERSITY OF OPINION*. Solving algebraically for WTP_D in equation 2 gives the required change in cost to offset an increase of β_2 in utility:[13]

$$WTP_D = -\beta_2/\beta_1 \qquad (3)$$

For example, estimates of $\beta_2 = 0.2$ and $\beta_1 = -0.01$ indicate that the WTP for an improvement in diversity of opinion from "Low" to "Medium" is $20 (= -0.2/0.01). Note that the model specification in equation 1 implies that the representative household would also be willing to pay the same amount ($20) for an improvement in diversity of opinion from "Low" to "Medium" as it would to move from "Medium" to "High." This constraint can be relaxed during econometric estimation so that the marginal utility for an improvement in diversity of opinion from "Medium" to "High" can be different from the marginal utility for an improvement in diversity from "Low" to "Medium."

This approach to estimating consumer valuations is used for all other features of the local media environment. The WTP for *COMMUNITY NEWS*, *MULTICULTURALISM* and *ADVERTISING* is the negative of the ratio of its marginal utility to the marginal disutility of *COST*. In summary, the WTP construct provides a theory-driven, intuitive (dollar) measure of

[13] The discrete-choice model actually estimates β_2/σ and β_1/σ, where σ is the scale parameter. The WTP calculation is not affected by the presence of the scale parameter because $-(\beta_2/\sigma)/(\beta_1/\sigma) = -\beta_2/\beta_1$.

the value consumers place on their local media environment and the specific features that comprise the environment. Moreover, by determining, for example, how much more valuable the medium level of the feature is than the low level, it is possible to quantify household benefits from changes in market conditions that affect the provision of the underlying features of media environment alternatives (see Section 3.3).

Households may not have identical preferences. Preferences towards multiculturalism, for example, may differ because of observable demographic characteristics, or may be not be observable or measurable. It is possible to estimate differences in the marginal utility of all features to different households by estimating the random utility model on various subsamples of the data according to demographic variables, such as age, education, gender, income, and race. We have this ability because of the large number of respondents answering our survey.

The utility of each media environment U^* is not observed. What is known is which option has the highest utility. For instance, when a respondent chooses the new media environment option A over B and then the status quo (SQ) over A, it is assumed that $U_A^* > U_B^*$ and $U_{SQ}^* > U_A^*$. For this kind of dichotomous choice data, a suitable method of estimation is maximum likelihood (i.e., a form of bivariate probit) where the probability of the outcome for each respondent-choice occasion is written as a function of the data and the parameters. The experimental design uses variation both between and within subjects. The within subject variation comes from the eight repeated A-B choice questions plus the follow up A or B vs. SQ choice questions, i.e., the choice between current home media environment and option A or B. The between subjects variation comes from the cross section of households that are surveyed. For details on the econometric model and calculation of WTP, see Appendix A.

3.3 *Consumer Valuations and Market Structure*

Estimates of utility from a differentiated-product model are useful for measuring the change in benefit, or consumer surplus, from a change in the features of a product alternative. For example, Rosston et. al. (2010) calculate the benefit of broadband Internet service to rural households by comparing their utility from before and after a change from a dial-up to a high-speed connection. By comparing these valuations to the cost of service provision, policy makers can make a more accurate judgment of the potential subsidy required, or not required, for individual broadband adoption and/or deployment in rural areas. Alternatively, policy makers may want to consider how a change in regulations or market structure affect the market's provision of product alternatives, and ultimately, how consumers value these changes in features between alternatives. For example, Crawford (2000) estimated the expected welfare gain per household from the changes in programming alternatives offered by cable television systems in response to the price caps from the Cable Act of 1992. Similarly, Economides et. al. (2008) quantified consumer welfare gains from the changes in product diversity and quality resulting from entry in New York local telephone markets following the Act.

An interesting question in media markets is how FCC policies on market structure affect the diversity and localism features of the media environment in a way that satisfies consumers. Ideally, we would like to directly estimate the value to society from a change in media ownership rules or merger guidelines. For example, consider the value from a merger that reduces the number of independent television voices in a market as it impacts the single media environment feature diversity of opinion (d). Below, we use this example to show what cannot and what can be estimated with our data.

A simple representation of the diversity of opinion produced for a consumer in television market $j = 1, 2, \ldots, J$ is:

$$d_{ij}^{*} = \alpha + \delta X_j + \gamma Z_i + v_{ij} \tag{4}$$

where d_{ij}^{*} is the (unobserved) continuous index of respondent i's diversity of opinion feature in market j, X_j is a vector of variables that measure media market structure and the size of the market, Z_i is a vector of demographic and media source variables that control for heterogeneity across consumers, α, δ, and γ are parameters to be estimated, and v is an independently and identically normally distributed error term with zero mean and constant variance σ_v^2.

The respondent reports one of three possible levels for the diversity of opinion feature, low, medium or high, based upon her level of d_{ij}^{*}:

$$d_{ij} = \begin{cases} low & d_{ij}^{*} \leq 0 \\ medium & 0 < d_{ij}^{*} \leq \mu \\ high & \mu < d_{ij}^{*} \end{cases} \tag{5}$$

where μ is the unknown level of d_{ij}^{*} above which respondents report a high level for diversity of opinion. Given v is normally distributed, equation 4 and equation 5 represent the conventional ordered probit model, which can be estimated by maximum likelihood (Zavoinia and McElvey, 1975). However, since the scale of diversity of opinion is not observed, we are unable to directly estimate the policy parameter of interest, δ. Rather, what is estimated is the ratio of δ to σ_v, where σ_v is the standard deviation of the errors in equation 4.[14]

Suppose that the number of independent television voices in the market is represented by X_1 and its associated parameter in equation 4 is δ_1. It is tempting to multiply the estimated δ_1 from equation 4 by the estimated β_2 from equation 1, to calculate the value to society from a

[14] The standard deviation has the same unit of measurement as d_{ij}^{*}, the index of diversity of opinion.

change in the number of independent television voices that affects the market's provision of diversity of opinion. However, this would result in:

$$\frac{\beta_2}{\sigma} \cdot \frac{\delta_1}{\sigma_v} \tag{6}$$

and not the actual effect that we are interested in. The problem is that we cannot observe the scale of diversity of opinion.

An alternative approach to equation 6 is to use our sample estimates from equation 1 and equation 4 to predict how changes in the number of independent television voices affect consumer's expected benefit from the diversity of opinion in their local media environment. Let the expected benefit from diversity of opinion for consumer *i* in market *j* be:

$$E[B_d(X_1)] = P_{dL}(X_1)b_{dL}^* + P_{dM}(X_1)b_{dM}^* + P_H(X_1)b_{dH}^* \tag{7}$$

where $P_{dL}(X_1)$ is the probability that the consumer will be in the low diversity of opinion state, $P_{dM}(X_1)$ is the probability that the consumer will be in the medium diversity of opinion state, $P_{dH}(X_1)$ is the probability that the consumer will be in the high diversity of opinion state, and b_{dL}^*, b_{dM}^* and b_{dH}^* are consumer valuations for low, medium and high diversity of opinion.

We do not observe b_{dL}^*, b_{dM}^* and b_{dH}^*. However, we are able to estimate from Step one the value the consumer places on a move from low to medium diversity of opinion (Δb_{dM}), and the value of a move from low to high diversity (Δb_{dH}). Substituting these valuations into the expected benefit equation 7 gives:

$$E[B_d(X_1)] = P_{dL}(X_1)b_{dL}^* + P_{dM}(X_1)(b_{dL}^* + \Delta b_{dM}) + P_{dH}(X_1)(b_{dL}^* + \Delta b_{dH}). \tag{8}$$

The effect of a change in X_1 on the expected benefit from diversity of opinion is:

$$\frac{\Delta E[B_d(X_1)]}{\Delta X_1} = \frac{\Delta P_{dL}}{\Delta X_1} b_{dL}^* + \frac{\Delta P_{dM}}{\Delta X_1} (b_{dL}^* + \Delta b_{dM}) + \frac{\Delta P_{dH}}{\Delta X_1} (b_{dL}^* + \Delta b_{dH})$$

$$= \left(\frac{\Delta P_{dL}}{\Delta X_1} + \frac{\Delta P_{dM}}{\Delta X_1} + \frac{\Delta P_{dH}}{\Delta X_1}\right) b_{dL}^* + \frac{\Delta P_{dM}}{\Delta X_1} \Delta b_{dM} + \frac{\Delta P_{dH}}{\Delta X_1} \Delta b_{dH}$$

$$= \frac{\Delta P_{dM}}{\Delta X_1} \Delta b_{dM} + \frac{\Delta P_{dH}}{\Delta X_1} \Delta b_{dH} \tag{9}$$

where $\frac{\Delta P_{dM}}{\Delta X_1}$ and $\frac{\Delta P_{dH}}{\Delta X_1}$ measure the effects of a change in X_1 on the predicted probability of being in the medium and the high diversity of opinion states, and $\frac{\Delta P_{dL}}{\Delta X_1} + \frac{\Delta P_{dM}}{\Delta X_1} + \frac{\Delta P_{dH}}{\Delta X_1} = 0$. Note that the marginal effects sum to zero, which follows from the requirement that the three probabilities sum to one.[15]

Equation 9 provides the basis for calculating the value to society from a merger between two television stations that affects the market's provision of diversity of opinion in local media environments. Estimates of Δb_{dM} and Δb_{dH} for the typical consumer are obtained from the demand estimates and marginal WTP calculations in Step one. Estimates of $\frac{\Delta P_{dM}}{\Delta X_1}$ and $\frac{\Delta P_{dH}}{\Delta X_1}$ for each individual consumer are obtained from the ordered probit model in Step two. Here, we use our estimated coefficients from the ordered probit model and the sample data to calculate the predicted pre-merger probability distributions for low, medium and high diversity of opinion. Holding all other things constant, we then reduce the number of independent

[15] The derivation of this result shows clearly that expected net benefit is a function of only willingness-to-pay for a change out of the low level of a feature, and a function of only the changes in probability for the medium and high levels of the feature. The other relevant quantities, the WTP for a change from the medium to the high level, and the change in probability for the low level of the feature, are not present in the formula. Equation 9 is valid essentially because of the two identities, $\Delta b_{dLH} = \Delta b_{dM} + \Delta b_{dMH}$, where Δb_{dLH} is the value the consumer places on a move from low to high diversity of opinion, Δb_{dMH} is the value the consumer places on a move from medium to high diversity of opinion and $\Delta P_{dL} + \Delta P_{dM} + \Delta P_{dH} = 0$, so that only two of the three quantities on the left hand sides of equation 8 and equation 9 above are in play.

A hypothetical but concrete example may be useful. Suppose from Step one we find Δb_{dM} = \$5 and Δb_{dH} = \$8. Further, suppose the initial distribution of ten individuals into the low, medium, and high regimes is (P_{L0}, P_{M0}, P_{H0}) = (0.3, 0.2, 0.5). As a result of a policy change, the new distribution is (P_{L1}, P_{M1}, P_{H1}) = (0.4, 0.4, 0.2), resulting in ΔP_{dM} = 0.2 and ΔP_{dH} = -0.3. The high regime has lost three members, the medium regime has gained two members, and the low regime has gained a single member. According to equation 9, expected net benefit is (\$5 × 0.2) + (\$8 × -0.3) = -\$1.40 per household. One way this can occur is if three households in the high regime move to the low regime, at a cost of 3 × \$ -8 = \$ -24, and two members of the low regime move to the medium regime, at a benefit of 2 × \$5 = \$10, for a total net benefit of -\$14. But Δb_{dM} = \$5 and Δb_{dH} = \$8 implies Δb_{dMH} = \$3. Another way the final distribution can be obtained is if two members of the high regime move to the medium regime and one member of the high regime moves to the low regime. This results in the same net benefit calculation of (-\$3 × 2) + (\$ -8 × 1) = -\$14.

television voices by one in the sample data to simulate the merger, and re-calculate the predicted post-merger probability distributions for low, medium and high diversity of opinion. The difference in predicted probabilities are used to form $\frac{\Delta P_{dM}}{\Delta X_1}$ and $\frac{\Delta P_{dH}}{\Delta X_1}$. These calculations are repeated for the multiculturalism, community news, and advertising features of the media environment, and then scaled to reflect the general population. See Section 6 for a more detailed description and example of the consumer benefit calculations.

FCC (2011) data are used to measure the media market structure variables in equation 4. There are many possible descriptions of media market structure reflecting the number of newspapers, radio stations, and television stations, and/or the extent to which these individual media outlets represent independent voices in the market place. Because we are interested in measuring the effects of a television merger on consumer demand and welfare, we use a parsimonious description of market structure, that is: the number of television stations in the market (*TV STATIONS*); the number of independent television voices in the market (*TV VOICES*); and the interaction between these two variables (*TV STATIONS* $\times$ *TV VOICES*). The addition of the interaction term makes it possible to examine the different impacts from a merger in say, small versus large markets.

The FCC (2011) measure *TV VOICES* by first combining all the television outlets within each individual market. The voiceprint of each outlet, that is, the listing of the unique parent company identifiers of all attributable owners of an outlet, is then created, sorted alphabetically, and duplicate voiceprints are eliminated. The parent identifier is then used to count the number of voices in the voiceprint for each outlet. Voiceprints composed of a single voice are added to the voice count of the market, while any voiceprint that includes one of the voices counted at the previous stage of the calculation are eliminated. These are voices that are

not independent because their voice has been heard on another outlet. This process is sequentially repeated based on the number of voices in the voiceprint.[16]

The survey questionnaire provides the household data used to construct the vector of demographic and media source controls, *Z*. The vector *Z* measures the head of the household's age (*AGE*), education (*EDUC*), gender (*GENDER*), household income (*INCOME*), and race (*RACE*). In addition, *Z* also includes 15 dummy variables to control for the different media source combinations that can be comprised from a newspaper, radio, television, the Internet, and Smartphone.[17]

Because it is comprised of demand- and supply-side terms for alternative features, the parameters on market structure in equation 9 are difficult to sign and they remain an empirical question. However, given positive marginal WTPs for the diversity and localism features, it is possible to focus more closely on the effects of a change in the number of independent television voices on the market's provision of product features. Theory and previous studies guide *a priori* expectations of the supply-side effects from a change in media market structure (e.g., Spence and Owen, 1977; Owen and Wildman, 1992; Chipty, 1995; Waldfogel, 2004; Shiman, 2007; and Sweeting, 2010). These expectations largely follow the efficiency versus market power arguments surrounding merger analysis. For example, the finding of $\frac{\Delta d^*}{\Delta X_1} < 0$ indicates that a decrease in *TV VOICES* is associated with an increase in the provision of more diversity of opinion in local media environments. This would be taken as evidence supporting

[16] Note that the FCC uses several different measures of "independent voices" when discussing ownership rules, and these measures include newspapers, radio and/or cable television. In Section 6, we report the results from sensitivity analysis of the effects of a television merger on consumer demand and welfare using an alternative description of market structure that controls for newspapers and radio stations.

[17] The survey administrator provides sample households without Internet access with a laptop computer and free Internet access to complete surveys. As such, the default media source combination is "Internet only", which comprises 1.1 percent of our sample. See Section 4.2 for the description of survey administration, and Table 6 for the distribution of media source combinations.

the hypothesis that parent companies use the efficiency gains from mergers to supply consumers with more diverse and local information, as measured by *DIVERISTY OF OPINION* and *COMMUNITY NEWS*. Among other things, efficiencies arise from economies of scale in the production of information for a larger geographic area (e.g., regional, domestic, and foreign news), and from the economies of scope from sharing information with co-owned stations and/or newspapers (Shiman, 2007). Size may also confer larger profits and increased ability to attract low-cost capital and devote more resources to research and development.

The finding of $\frac{\Delta d^*}{\Delta X_1} > 0$ indicates that a decrease in *TV VOICES* is associated with the provision of less diversity of opinion. This would be taken as evidence supporting the hypothesis that consolidation leads to the softening of competition and the provision of less diverse and more non-local information. More specifically, parent companies exercise market power by providing fewer viewpoints and by limiting their investments in new and diverse information programming. There may also be decreases in managerial efficiency that increase the costs of production and affect the supply of programming. For example, Farrell (1983) and Nalebuff and Stiglitz (1983) show that a decrease in the number of competitors in the market limits the effectiveness of both efficiency-improving tournaments and relative-performance evaluations. de Bettignies and Ross (2011) show that less competition can lead to control problems and higher agency costs for owners monitoring managers.

There are several other theoretical explanations for the relationship between *TV VOICES* (*TV STATIONS*) and product quality, with the sign dependent on how entry affects consumer responsiveness to changes in quality (Spence, 1975; Schmalensee, 1979; Chen and Schwartz, 2010; Matsa, 2010). As noted by Matsa, lower profit margins under more competition reduces the immediate costs of losing a “sale” (e.g., revenue from the purchase of a

daily newspaper, or advertising revenue from viewers consumption of a daily radio and/or television shows), so media outlets may shade quality. However, in the long run, competition may raise the likelihood that unhappy consumers switch to a new media provider, so media outlets improve quality.[18] Chen and Schwartz also outline conditions whereby the incentive to add a new, higher-quality product can be greatest under monopoly. The monopolist loses more profit on the old product ("diversion effect") but may earn more profit on the new one ("coordination effect") because it prices the old product in a way that internalizes the effect on the new one. The relative strength of these opposing diversion and coordination effects depends on the particular properties of demand.

4. Data

4.1 *Experimental Design*

The WTP for local media environment features are estimated with data from an online survey questionnaire employing repeated discrete-choice experiments. The questionnaire begins with the cognitive buildup section that describes the respondent's local media environment in terms of the offerings from newspapers, radio, TV, the Internet, and Smartphone. Respondents are asked questions about their media sources, how much information they consume from each source, the cost of their media sources, and the quality of the four different features of their media environment described in Table 1.[19] The descriptions of the "Media Environment Features" as they appear in the survey are provided in Appendix B.

[18] Matsa (2010) shows empirically that supermarkets facing more intense competition have more product availability, and Mazzeo (2003) shows that average flight delays are longer in more concentrated airline markets. In contrast, Domberger an Sherr (1989) find no correlation between the threat of new entry and customer's self-reported satisfaction with their attorney used for house purchases.

[19] Respondents were asked to consider what is available in their local media environment, rather than what they usually view or listen to. This represents a statement about the amount and quality of information programming being produced by media sources for their consumption.

Cognitive buildup is followed by the choice experiments. Information from the cognitive buildup questions is used to summarize each respondent's actual "status quo" (SQ) media environment at home in terms of the media sources they use to get their information, the levels of the features of their environment: *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, *MULTICULTURALISM* and *ADVERTISING* features, and their *COST*. A table summarizing the sources and features of the respondent's actual media environment at home is presented before the choice task (see Figure 1 for an example). The respondent is then instructed to answer the eight choice scenarios within the choice task. In each choice scenario, a pair of new media environment options, A and B, is presented. The two options provide information on news and current affairs from the same set of media sources indicated by the respondent during cognitive buildup, but differ by the levels of the features. Respondents indicate their preference for choice alternative A or B. A follow-up question is then presented that asks respondents to make an additional choice between their preferred alternative, A or B, and their actual SQ media environment at home. See Figure 2 for a choice scenario example.

We used market data from newspapers, radio and television stations, Internet and mobile telephone service providers, a pilot study and three focus groups to test and refine our descriptions of the features for choice alternatives A and B. The first focus group, with a hard-copy version of the survey, was held on December 9, 2010, in a room of the Economics building at the University of Colorado at Boulder. Four individuals, two men and two women, a local service employee and three staff members of the Economics Department (undergraduate advisors and clerical workers) took the survey under supervision of the principal investigator and answered detailed questions regarding how they interpreted the questions and what they were thinking when they answered them. The second focus group, with an online survey, was

facilitated by RRC Associates in Boulder on February 2, 2011. The group consisted of five diverse individuals with respect to age, gender, and work Internet experience, who completed the survey sequentially in the presence of a professional facilitator. A report describing the findings from the second focus group is provided in Appendix C.

Measures developed by Huber and Zwerina (1996) and Zwerina et. al. (1996) were used to generate an efficient non-linear optimal design for the levels of the features that comprise the media environment choice. A fractional factorial design created 72 paired descriptions of media environment, A and B, that were grouped into nine sets of eight choice questions. The nine choice sets were rebalanced to ensure that each household faced a range of costs that realistically portrayed the prices for media sources in their local media environment. For example, a respondent who indicated that they pay nothing for their local media environment was exposed to a range of costs that included zero dollars per month. Accordingly, $COST_1$ ranged from $0 to $50 for households that indicated that the total cost of their actual media environment at home was less than or equal to $30 per month. $COST_2$ ranged from $5 to $100 for households that indicated that their total cost was greater than $30 but less than or equal to $70 per month. $COST_3$ ranged from $5 to $150 for households that indicated that their total cost was greater than $70 but less than or equal to $120 per month. $COST_4$ ranged from $10 to $200 for households that indicated that their total cost was greater than $120 but less than or equal to $180 per month. $COST_5$ ranged from $10 to $250 for households that indicated that their total cost was greater than $180 per month.[20]

[20] The upper limit of $250 per month is the total cost for a media environment with a seven-day subscription to a premium newspaper, such as the New York Times or San Francisco Chronicle ($25), a "All of XM" subscription to satellite radio ($20), a premier subscription to cable or satellite television ($110), a subscription to very-fast Internet service ($45), an unlimited data subscription for a Smartphone ($30), and $10 monthly memberships to both NPR and PBS.

The nine choice sets were randomly distributed across all respondents. Upon completion of their cognitive buildup questions, an online algorithm calculated each individual's total cost of their local media environment and assigned the appropriate cost range for the choices experiments, either $COST_1$, $COST_2$, $COST_3$, $COST_4$, or $COST_5$. To account for the possibility of order effects that could confound the analysis, the order of the eight A-B choices questions within each of the nine choice sets were also randomly assigned across all respondents.

The methodology used to estimate consumer utility has several important characteristics. First, the experimental approach determines the levels of the features of each media environment offered exogenously and avoids collinearity problems by offering non-existing alternatives. For example, the levels for the diversity of opinion, community news and/or multiculturalism features change independently in the hypothetical alternatives as opposed to market data where they are often positively correlated.[21] By asking respondents to complete eight choice experiments, we are able to increase parameter estimation precision, and reduce sampling costs by obtaining more information on preferences for each respondent. Second, the choice data are used to estimate parameters of the representative household's utility function. This has the advantage that from estimates of these structural parameters, we can construct estimates of the value of *any* variant of the current and future media environment described by the levels of the five features.

Because some of our data are from choice experiments, we need to be concerned with hypothetical bias and survey fatigue. Hypothetical bias arises when the behavior of the respondent is different when making choices in a hypothetical market versus a real market. For

[21] By holding all media sources and unobserved features of the media environment constant within each individual household's choice task, the discrete-choice model also eliminates any potential correlation between prices and the unobserved quality of the media environment options.

example, if the respondent does not fully consider her budget constraint when making choices between hypothetical options A and B, WTP may be overestimated, because the cost parameter in the denominator of the WTP calculation (see Section 3.2) will be biased toward zero and the marginal utility parameter in the numerator will be biased away from zero. We believe this bias is less of a concern in this study as opposed to studies that ask consumers to value environmental goods or advanced telecommunications services that are not provided in markets. Because most consumers have paid for many different media sources in actual markets, they should have a reasonable understanding of their preferences for their local media environment, and how their choices are constrained by their budget and time. Nevertheless, recent papers by Cummings and Taylor (1999), List (2001), Blumenschein et. al. (2008) and Savage and Waldman (2008) have proposed methods for minimizing hypothetical this source of bias. In this paper, we follow Savage and Waldman by employing a follow-up question that asks respondents to make an additional choice between their new choice, A or B, and their actual media environment at home. This additional non-hypothetical market information is then incorporated into the likelihood function that is used to estimate marginal utility parameters.

Survey fatigue can arise from a lengthy questionnaire and make estimates from later scenarios differ from earlier scenarios. Carson et. al. (1994) review a range of choice experiments and find that respondents are typically asked to evaluate eight choice scenarios. Savage and Waldman (2008) found there is some fatigue in answering eight choice scenarios when comparing online to mail respondents. To minimize survey fatigue in this study, we have reduced the cognitive burden by dividing the choice task into two sub groups of four choice

scenarios. Here, the respondent is given a break from the overall choice task with an open-ended valuation question between the first and second set of four scenarios.[22]

4.2 *Survey Administration*

Knowledge Networks Inc. (KN) administered the household survey online. KN panel members are recruited through national random samples, almost entirely by postal mail. For incentive, panel members are rewarded with points for participating in surveys, which can be converted to cash or other rewards.[23] An advantage of using KN is that it obtains high completion rates and the majority of the sample data are collected in less than ten days. KN also provides detailed demographic data for each respondent. Because these demographics are previously recorded, the length of the field survey is shortened to less than 20 minutes, which ensures higher quality responses from the respondents.

During the week of March 7, 2011, KN randomly contacted a gross sample of 8,621 panel members by email to inform them about the media environment survey.[24] The survey was fielded from March 11 to March 21. A total of 5,548 respondents from all 50 states and the District of Columbia completed survey questionnaires for a response rate of 64.4 percent. We trimmed the net sample by eliminating: 341 respondents with a completion time of less than six and one-half minutes; 46 respondents who skipped any questions in the choice task; 14 respondents who indicated that they pay $500 or more per month for the media sources within

[22] For a robustness check, we compared our baseline estimates of utility in Table 10 below for the AB-SQ bivariate probit model with estimates on the data for the hypothetical A-B choices only, as well as with estimates on the data for the first four choice questions only, and get similar results.

[23] Unlike convenience panels that only include volunteers with Internet access, KN panel recruitment uses dual sampling frames that includes both listed and unlisted telephone numbers, telephone and non-telephone households, and cellphone-only households, as well as households with and without Internet access. If required, households are provided with a laptop computer and free Internet access to complete surveys, but they do not participate in the incentive program.

[24] The invitation email has the subject heading and approximate time for completion, estimated from KN's online pretest on 39 respondents.

their local media environment; 11 respondents who provided incomplete cost information; and five respondents who provided incomplete information on the features of their media environment.[25] The median completion time for our final sample of 5,131 respondents with complete information was about 16 and three-quarter minutes. The panel tenure in months for final sample respondents ranged from one to 136, with a mean of 41.18 and standard deviation of 31.33.[26]

Table 2 presents a selection of demographics for the U.S. population, for all KN's panel members, and for panel members who were invited to participate in this survey (Knowledge Networks, Inc., 2010; United States Census Bureau, 2009). The demographics for all KN panel members are similar to those reported by the Census Bureau. Casual inspection of column four and column five of Table 2 also show that, apart from race and employment status, the demographics for the gross sample of panel members invited to participate in this study and the final sample of respondents who completed questionnaires are also similar to those reported by the Census Bureau. However, estimates from the probit model that compares respondent's characteristics between the gross sample and the final sample also indicate potential differences in age, gender, education and Internet access between our final sample and the population. We remedy this possible source of bias in our results in Section 5 by estimating with weighted maximum likelihood, where the contribution to the log likelihood is the post-stratification weight times the log of the bivariate probability for the individual choice occasion.[27]

[25] Our pilot study, focus groups and other testing indicated that the minimum time needed to complete the survey was about six or seven minutes. Because they may be shirking, we removed the 341 respondents in our survey with a completion time of less than six and one-half minutes. Evidence from KN suggests that this behavior is not specific to our survey style or content. Our sample's distribution of interview duration in minutes is very similar to other KN surveys with median completion times ranging from seven to 19 minutes.
[26] See Dennis (2009) for a description of the within-panel survey sampling methodology.
[27] See Appendix D for the probit model estimates and the procedures used to develop the post-stratification weights used for weighted maximum likelihood estimation.

4.3 *Media Environment at Home*

Table 3 presents summary statistics for respondent's media sources. Column two and column three show that about 94 percent of sample respondents watch television, about 81 percent listen to the radio, and about 80 percent use the Internet. About 45 percent of respondents read a paper or online newspaper regularly, and about 24 percent of sample respondents own a Smartphone. On average, television viewers spend about 1.9 hours on a typical day watching television to get information on news and current affairs, radio listeners spend about 1.4 hours listening to the radio to get information on news and current affairs, and Internet users spend about one hour online (e.g., MSN, Yahoo, radio and TV station web sites, journalists' blogs) to get information on news and current affairs. Newspaper readers also spend about one hour on a typical day reading the newspaper, while Smartphone owners use their phone to go online for about 0.6 hours to get information on news and current affairs online. Table 4 shows that the most popular media source combinations are radio, television and the Internet, about 30 percent of sample respondents, and newspaper, radio, television and the Internet, about 26 percent of sample respondents.

Summary statistics for media environment features are presented in Table 5. These data indicate that, on average, the levels of the *DIVERISTY OF OPINION*, *COMMUNITY NEWS*, *MULTICULTURALISM* and *ADVERTISING* features were about "medium." About 58 percent of respondents indicated that they bundled their subscription television service with the Internet and/or telephone service. The price (or, *COST*) for the typical media environment ranged from zero to $447 per month, with an average of $111.20 per month. Interestingly, about ten percent of the sample indicated that they have contributed to public radio stations and/or public TV stations during the past twelve months at an average of $9.30 per month.

4.4 *Satisfaction With Media Environment Features*

Additional information on household satisfaction with their media environment was obtained by asking respondents to indicate on a scale from one to five, with one indicating "not satisfied" and five indicating "very satisfied", how satisfied they were with each feature, and their overall media environment. Table 6 and Table 7 show that the distribution of responses are similar for *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, and *MULTICULTURALISM*, with almost 90 percent of households indicating a satisfaction score of at least three for each of these features. Households are less satisfied with *COST* and *ADVERTISING*. About 60 percent of households indicated a satisfaction score of at least three for each of these two features.

Table 8 presents summary statistics from FCC (2011) data that show considerable variation in market structure between the 203 television markets in our sample.[28] At December, 2009, the total number of newspaper, radio, and television outlets (*MEDIA OUTLETS*) ranged from four to 291, with an average of 139 per television market. On average, about 81 percent of media outlets are radio stations, which partially reflects the fact that the geographical definition of a television markets can include several radio markets. Moreover, when examining the market structure data at the 75th percentile, we observe that most markets are served by about 182 media outlets or less. The bottom panel in Table 8 shows a similar pattern for small television markets with five or less television stations. At December, 2009, the total number of newspaper, radio and television outlets in small markets ranged from four to 86, with an average of 47 per market. On average, about 82 percent of media outlets in small

[28] There are 210 television markets in the U.S. The seven markets not covered by our sample are: Bend, OR; Fairbanks, AK; Grand Junction, CO; Missoula, MT; North Platte, NE; Ottumwa, MO; and Presque, ME. All seven markets are small markets with five or less television stations. As shown in Table 10, the remaining small markets in our sample cover 8.43 percent of households. FCC (2011) data show that 8.37 percent of population households were in small markets at December, 2009.

markets are radio stations, and as indicated by the 75th percentile, most small markets are served by about 57 media outlets or less.[29]

Evidence of the relationship between consumer satisfaction with their local media environment and television market structure is presented in Table 9. We use the ordered probit model to estimate the effect on consumer satisfaction, as measured by *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, *MULTICULTURALISM*, *ADVERTISING* or *OVERALL MEDIA ENVIRONMENT* (i.e., how satisfied are you with your overall media environment), from *TV STATIONS*, *TV VOICES*, and *TV STATIONS*$\times$*TV VOICES*, the vector of demographic controls, X = [*AGE*, *EDUC*, *GENDER*, *INCOME*, *RACE*], and dummy variables that control for the 15 media source combinations. The values for each of the dependent variables range from one to five with one indicating "not satisfied" and five indicating "very satisfied." The estimated coefficients on the demographic variables indicate that the elderly are more satisfied with the diversity of opinion, community news and multiculturalism features of their media environment, but less satisfied with advertising. Similarly, educated respondents are more satisfied with their diversity of opinion and multiculturalism features, but less satisfied with advertising. White respondents are likely to be more satisfied with their diversity of opinion and multiculturalism features, but are less satisfied community news and advertising. Only two of the estimated coefficients on the individual market structure variables are significant at conventional levels in all five specifications. For example, the positive coefficient on *TV VOICES* in column three indicates that, all other things held constant, an increase in the number of independent television voices in the market is associated with a increase in consumer's satisfaction with the multiculturalism feature of their local media environment.

[29] See Appendix E for a description of the variables in Table 8.

There are several possible explanations for the insignificant coefficients on most of the market structure variables in Table 9: there is no relationship between consumer satisfaction with the media environment and television market structure; the five-point index is not a good measure of consumer satisfaction; and/or the television variables may not provide an accurate representation of market structure. In Section 5, we quantify consumer satisfaction in dollars by estimating the marginal willingness-to-pay for *DIVERSITY OF OPINION*, *MULTICUL-TURALISM*, *COMMUNITY NEWS* and *ADVERTISING*. In Section 6, we use the WTP estimates to calculate how expected consumer welfare from the local media environment varies between different market structures.

5. Consumer Valuations

The choice data described in Section 4.1 are used to estimate a bivariate probit model of household utility from their local media environment. Since each pair of binary choices, A vs. B, and A or B vs. SQ, for each choice occasion represents information on preferences, the starting maximum sample size for econometric estimation is n = 5,031 x 8 = 40,248. Table 2 showed some demographic differences our final sample and the population. We remedy this possible source of bias in our results by estimating with weighted maximum likelihood, where the contribution to the log likelihood is the post-stratification weight times the log of the bivariate probability for the individual choice occasion.

5.1 *Baseline Results and Robustness*

Table 10 reports weighted maximum likelihood estimates of the baseline model of household utility. Because consumers may have heterogeneous preferences for unmeasured

aspects of media environment alternatives, we estimate utility with a constant to capture differences in tastes between the status quo and new A and B media options.[30] Marginal utility parameters (MU), asymptotic t-statistics for the marginal utilities (t), WTP calculations (WTP) and standard errors for the WTP calculations (s.e.) are presented in columns two through five. The estimate of the ratio of the standard deviation of the errors in evaluating the hypothetical alternatives to the errors in the status quo alternative, $\lambda = 1.49$, is greater than one. Respondents appear to have more consistency in choice when comparing the new media environment options than when comparing a new option to a real alternative.[31]

The data fit the baseline model well as judged by the statistical significance of most parameter estimates. The marginal utility parameters for *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, and *MULTICULTURALISM* are positive and are significant at the one percent level. The marginal utility parameters for *COST* and *ADVERTISING* are negative and statistically significant at the one percent level. The estimated signs for these media features imply that the representative consumer's relative utility increases when: the information on news and current affairs from different viewpoints is increased; the amount of information on community news and events is increased; the amount of information on news and current affairs reflecting the interests of women and minorities is increased; the amount of space and/or

[30] Holding all other features of the media environment constant, the difference in utility between the status quo and the new media environment option can be interpreted as the consumer's disutility from switching from the status quo to the new media environment. Dividing this difference by the marginal disutility of *COST* provides an estimate of the average consumer switching cost, here, about \$26 (= 0.319/0.012) per month. Another way of examining switching costs is by comparing them to respondent's annualized average monthly cost of their media environment, here \$1,334 (= 111.2×12). The estimated switching cost is about 23 percent of annual consumer expenditures on the media sources that comprise their media environment. For comparison, Shcherbakov (2007) estimated that switching costs comprise about 32 and 52 percent of annual expenditures on cable and satellite television services, respectively.

[31] The parameter λ is generally estimated to be greater than one in most models in Table 10 through Table 18. We report its estimate and the corresponding test statistic, but do not discuss it further.

time devoted to advertising is decreased; and the dollar amount the household pays per month for their media environment is decreased.

DIVERSITY OF OPINION and *COMMUNITY NEWS* are important features of the local media environment with consumers willing to pay $13.06 per month for different viewpoints in the reporting of information on news and current affairs, and $13.95 for more information on community news and events. Consumers also value *MULTICULTURALISM*, although the willingness to pay for this feature is less precisely estimated. The results show that consumers would be willing to pay an additional $1.82 per month for more information that reflects the interests of women and minorities. As expected, consumers have a distaste for *ADVERTISING*. The representative consumer would be willing to pay $8.18 per month for a marginal decrease in the amount of advertising they have to listen to or view.

Because our data are from choice experiments, we check the sensitivity of our results with respect to hypothetical bias and survey fatigue.[32] Our first robustness check examines the potential for hypothetical bias by observing how the omission of consumer choice data from actual markets affected our results. Here, we compared baseline estimates of the bivariate probit model on data for the A versus B and A or B versus SQ choices with estimates from the univariate probit model on the data for the A-B choices only. The results, reported in column six through column nine of Table 11, show that the two models produce reasonably similar estimates of willingness to pay. Households have relatively similar valuations for *DIVERSITY*

[32] The distributions of answers to the choice scenarios show that in 53 percent of the A-B choice questions, respondents chose new media environment option A over B. Because the order of the choice scenarios is randomized, this has no effect our results. In the follow up questions, respondents chose to stay with their actual (status quo) media environment over the new option, A or B, in about 71 percent of the choice questions. About 12.7 percent of the choice occasions respondents chose to change to hypothetical media environment A, and about 16.4 percent of the time they chose to switch to hypothetical environment B. The number of seconds it took respondents to answer the eight choice questions remained essentially constant over the eight choice occasions.

OF OPINION and *COMMUNITY NEWS* in the univariate probit model, while the valuation for *MULTICULTURALISM* is lower.

Our second robustness check looks for any major differences in household valuations of their media environment features as they progress through the choice task, perhaps reflecting survey fatigue. Here, we compared the baseline estimates of the bivariate probit model on the data for the first four choice questions versus the second four questions. The results, reported in column six through column nine of Table 12, show reasonably similar estimates for the two subsamples of data. There is no systematic pattern that could be taken as evidence of survey fatigue.

5.2 *Heterogeneous Preferences*

Because they do not have identical preferences, it is possible that individual consumer's WTP for their media environment varies with observable demographics such as age, education, gender, income, and race. For example, women and non-white households may have stronger preferences for *MULTICULTURALISM*, and, because of a higher opportunity costs of time, higher income households may have a stronger distaste for *ADVERTISING*.[33]

Table 13 reports estimates of the random utility model for subsamples of respondents aged from 18 to 29 years, 30 to 44 years, 45 to 59 years, and respondents aged 60 years and over. Willingness-to-pay for more information on community news and events increases with age, from $8.96 to $20.78 per month. Willingness-to-pay for more information that reflects the interests of women and minorities decreases with age, with the 60 years and over group placing no value on this particular feature. Younger consumers have less distaste for advertising.

[33] The likelihood ratio test statistics for Table 13 through Table 18, not reported, are large and reject the hypothesis that the estimated marginal utilities are equal across different subsamples.

Respondents aged 18 to 44 years are willing to pay about $5 or $6 per month for a decrease in the amount of advertising in their media environment, whereas respondents 45 years and over are willing to pay about $9 to $12 per month.

The possibility that preferences vary with education is examined in Table 14 which reports estimates for a subsamples of respondents with less than high school education, with a high school education, some college, and with a bachelors degree or higher. Willingness-to-pay for diversity of opinion, information on community news and events, and information that reflects the interests of women and minorities increases with years of education. Respondents with no college experience do not value information that reflects the interests of women and minorities. Moreover, they are willing to pay about $4 or $6 per month for a decrease in the amount of advertising in their media environment compared to educated respondents who are willing to pay about $9 to $10 per month.

Table 15 reports estimates for a subsample of low income respondents (i.e., annual household income less than $25,000), a subsample of middle income respondents (i.e., annual household income more than $25,000 but less than $75,000) and a subsample of high income respondents (i.e., annual household income greater than $75,000). Valuations for diversity of opinion, more information on community news and events, and (less) advertising all increase with income. Low-income respondents do not value information on news and current affairs that reflects the interests of women and minorities, however, middle- and high-income respondents are willing to pay about $1.50 to $2.50 per month for more information that reflects the interests of women and minorities.

Estimates of utility for subsamples of male and female respondents are reported in Table 16. The estimated willingness-to-pay for diversity of opinion, information on

community on news and events and less advertising are very similar across these groups. However, while females are willing to pay about $3 per month for information on news and current affairs that reflects the interests of women and minorities, males place no value on this type of information from their local media environment. Estimates of utility and WTP for subsamples of white and non-white respondents are reported in Table 17. White consumers are willingness-to-pay more for diversity of opinion, information on community news and events, and less advertising that non-white households. White consumers do not value information on news and current affairs that reflects the interests of women and minorities. In contrast, non-white consumers are willing to pay about $5 per month for more information that reflects the interests of women and minorities. This relationship is explored further by estimating the random utility model on subsamples of white versus non-white males and white versus non-white females. The results, reported in Table 18, are similar in flavor to those reported for the male and female subsamples. Non-white males are willing to pay $3.48 per month for more information that reflects the interests of women and minorities, white females are willing to pay $1.52 per month, and non-white females are willing to pay $6.16 per month.

5.3 *Non-Linear Preferences*

Up to this point the coding of the four non-price features in the household utility function have been linear, which implies that the marginal utilities are the same when moving from low to medium and from medium to high. We now relax this restriction by replacing each of the four features with a pair of dichotomous variables. For example, *MEDIUM DIVERISTY OF OPINION* equals one when *DIVERISTY OF OPINION* equals “medium” and zero otherwise, and *HIGH DIVERISTY OF OPINION* equals one when *DIVERISTY OF OPINION*

equals “high” and zero otherwise. Here, the estimated parameter on *MEDIUM DIVERISTY OF OPINION* measures the change in utility from moving from information on news and current affairs in the household’s overall media environment reflecting only one viewpoint to a few different viewpoints. The estimated parameter on *HIGH DIVERISTY OF OPINION* measures the change in utility from moving from information on news and current affairs reflecting only one viewpoint to many different viewpoints. This approach to estimating non-linear consumer valuations is used for all of the other non-price features of the local media environment.

Estimates of the utility model with non-linear preferences are presented in Table 19. We first note that the these estimates are very consistent with the marginal WTP estimates calculated for linear preferences in Table 10. For example, Table 19 shows that the representative consumer is willing to pay $25.28 per month for an improvement in diversity of opinion from low to high medium, while Table 10 shows that the consumer would be willing to pay $26.12 (= $2 \times$ $13.06) for the same improvement. Similar, consistent findings are also found for *COMMUNITY NEWS*, *MULTICULTURALISM* and *ADVERTISING*.

The estimates from Table 19 suggest declining marginal utility with respect to diversity of opinion, community news and multiculturalism. The representative household is willing to pay $18.86 per month for an improvement in diversity of opinion from low to medium, but only another $6.42 per month for an additional improvement to high diversity of opinion. Similarly, the representative household is willing to pay $20.54 per month for an initial improvement in information on community news and events from low to medium, but only another $6.39 per month for an additional improvement to high. The marginal utility estimates for *MULTICULTURALISM* indicate that households value an improvement in information that reflects the interests of women and minorities from low to medium (i.e., WTP = $4.03) about

the same as an improvement from low to high (i.e., WTP = $3.96).[34] In other words, *a lot* of information reflecting the interests of women and minorities is valued the same as *some* information. The marginal utility estimates for *ADVERTISING* indicate a similar pattern, albeit in reverse, with respect to the amount of space and/or time devoted to advertising in the household's media environment. The representative household is willing to pay about $17.37 per month for a move from high to medium advertising, but would pay only an additional $2.85 per month to move from medium to low advertising.

6. Change in Consumer Welfare From a Television Merger

The policy question of interest is how do FCC ownership rules and merger guidelines affect the diversity and localism features of the media environment in a way that satisfies consumers We shed light on this question in Step two of our empirical analysis by estimating equation 4, which measures the effects of a change in *TV VOICES* on respondent *i*'s perceived quality of her local media environment features in market *j*. We then use our demand estimates from Step one to calculate the effects on consumer welfare form a one-unit decrease in *TV VOICES* that results in quality differences between the pre- and post-merger markets.

6.1 *Ordered Probit Model Estimates of Equation 4*

Table 20 reports the estimated coefficients and standard errors from weighted maximum likelihood estimation of equation 4. We use the ordered probit model to estimate the effect on product quality, as measured by *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, *MULTICULTURALISM*, or *ADVERTISING* from *TV STATIONS*, *TV VOICES*, and

[34] In statistical terms, the two WTP estimates for *MEDIUM MULTICULTURALISM* and *HIGH MULTICULTURALISM* are not significantly different from one another.

TV STATIONS×*TV VOICES*, the vector of demographic controls, X = [*AGE*, *EDUC*, *GENDER*, *INCOME*, *RACE*], and dummy variables that control for the 15 media source combinations. The values for each of the dependent variables range from one to three with one indicating "low", two indicating "medium" and three indicating "high." The estimated coefficients on the demographic variables indicate that the elderly, and educated respondents, are likely to perceive higher quality in the diversity of opinion, community news and multiculturalism features of their media environment, but lower quality with respect to advertising (i.e., too much advertising). In contrast to Table 9, where the 5-point index of consumer satisfaction is the dependent variable, the television market structure variables are reasonably good predictors of product quality. The estimated coefficients on *TV VOICE* are positive and significant for *DIVERSITY OF OPINION*, *MULTICULTURALISM* and *ADVERTISING*. This suggests that following a decrease in the number independent television voices in the market, consumers are more likely to be in a state with less diversity of opinion, less multiculturalism, and less advertising. Moreover, when evaluated at the mean value for *TV STATIONS* of 12.74, linear estimates of $\partial\boldsymbol{\beta}'\mathbf{x}/\partial$*TV VOICES* for *DIVERSITY OF OPINION*, *MULTICULTURALISM* and *ADVERTISING* are significant at the five percent level.[35] Because $\partial\boldsymbol{\beta}'\mathbf{x}/\partial$*TV VOICES* for *COMMUNITY NEWS* is not precisely estimated, we exclude this feature from the merger analysis below.

[35] $\partial\boldsymbol{\beta}'\mathbf{x}/\partial$*TV VOICES* is the effect of *TV VOICES* on the index function in equation 4, $\boldsymbol{\beta}'\mathbf{x}$, where $\mathbf{x} = [1, X_j, Z_i]$, 1 is a vector of ones, and $\boldsymbol{\beta} = [\alpha, \delta, \gamma]$. We also evaluated $\partial\boldsymbol{\beta}'\mathbf{x}/\partial$*TV VOICES* over the range of values for *TV STATIONS* from five to 20 for each of the four features. The effects are significant at the five percent level for all values of *TV STATIONS* for *DIVERSITY OF OPINION*, *MULTICULTURALISM* and *ADVERTISING*. The effects are not significant for *COMMUNITY NEWS*.

6.2 *Merger Algorithm*

The procedure to calculate the changes to consumer welfare from a merger between two television stations is:

(i) Estimate the marginal WTP per month for a move from a low level of the feature to the medium level, and from the low level to the high level. These estimates are from the non-linear specification of preferences reported in Table 19, and they are replicated directly below for easier exposition. For example, row two-column two below shows that the representative consumer is willing to pay $ 18.86 for a move from low to medium diversity of opinion in her local media environment.

Feature	Low to medium (Δb_M)	Low to High (Δb_H)
DIVERSITY OF OPINION	$18.86	$25.28
MULTICULTURALISM	$20.54	$26.93
ADVERTISING	-$2.85	-$20.22

(ii) Estimate the ordered probit model of equation 4 and obtain coefficient estimates of the effect of *TV VOICES* (and other independent variables) on the quality of a respondent's media environment features. These coefficients are reported in Table 20.

(iii) Given the existing (pre-merger) sample data, use the estimated coefficients from (ii) above to predict each respondent's pre-merger probability distribution of low, medium and high values for each of the three media environment features, where:

P_{L0} is the pre-merger probability of a low level of the feature;

P_{M0} is the pre-merger probability of a medium level of the feature; and

P_{H0} is the pre-merger probability of a high level of the feature.

(iv) Simulate the merger between two television stations by reducing the number of independent television voices in the sample by one, all other things held constant. Repeat (iii) above to predict each respondent's post-merger probability distribution of low, medium and high values for each of the three media environment features, where:

P_{L1} is the post-merger probability of a low level of the feature;

P_{M1} is the post-merger probability of a medium level of the feature; and

P_{H1} is the post-merger probability of a high level of the feature.

(v) Use the probabilities in (iii) and (iv) to form, for each respondent, $\frac{\Delta P_L}{\Delta X_1}$, $\frac{\Delta P_M}{\Delta X_1}$ and $\frac{\Delta P_H}{\Delta X_1}$, for each of the three local media environment features, where $\Delta P_L = P_{L1} - P_{L0}$, $\Delta P_M = P_{M1} - P_{M0}$, $\Delta P_H = P_{H1} - P_{H0}$, and $\Delta X_1 = 1$. For example, let $\frac{\Delta P_L}{\Delta X_1} = 0.0089$, $\frac{\Delta P_M}{\Delta X_1} = 0.0074$ and $\frac{\Delta P_H}{\Delta X_1} = -0.0163$ for the advertising feature. The interpretation is that if the number of independent television voices is reduced by one, the probability that respondent *i* is in a low advertising environment will increase by 0.0089, the probability that respondent *i* is in a medium advertising environment will increase by 0.0074 and the probability that respondent *i* is in a high advertising environment will decrease by 0.0163.[36]

(vi) Use the estimates of marginal WTP in (i) and the change in predicted probabilities in (v) to evaluate equation 9 for each respondent. This is the effect of a one-unit change

[36] The sample means of the predicted probabilities are presented in Table 21. For our example of advertising, they have the following interpretation. Following the reduction in the number of independent television voices by one, the percentage of households in a low advertising environment will increase by 0.0089, the percentage of households in a medium advertising environment will increase by 0.0074, and the percentage of households in a high advertising environment will decrease by 0.0163.

in the number of independent television voices (X_1) on the respondent's expected consumer welfare from diversity of opinion, multiculturalism or advertising (a). To continue the advertising example, equation 9 is:

$$\frac{\Delta E[B_a]}{\Delta X_1} = \frac{\Delta P_{aM}}{\Delta X_1} \Delta b_{aM} + \frac{\Delta P_{aH}}{\Delta X_1} \Delta b_{aH} \qquad (9')$$

and the expected change in welfare for consumer i from a one-unit reduction in the number of independent television voices is:

$\frac{\Delta E[B_a]}{\Delta X_1}$ = (-\$2.85 × 0.0074) + (-\$20.22 × -0.0163) = \$0.31, which represents a gain to consumer i of about 31 cents per month from less advertising in her media environment.

(vii) Sort the expected welfare changes in (vi) for each respondent by the number of television stations, ranging from five to 20. Calculate the mean expected welfare change per month for all respondents in a market with five stations, for all respondents in a market with six stations, for all respondents in a market with seven stations, … , and all respondents in a market with 20 stations.

(viii) Use the FCC (2011) data to count the number of population households in a television market with five stations, six stations, seven stations, … , and 20 stations.

(ix) Calculate the aggregate annual change in consumer welfare from the merger between two television stations by multiplying (vii) by 12 by (viii) for each level of the number of television stations, i.e., five stations, six stations, seven stations, etc.

6.3 *Merger Results*

Table 22 presents the results from our hypothetical merger between two television stations. The results show that, all other things held constant, diversity of opinion, the coverage of multicultural issues, and the amount of advertising decrease following the merger. These changes in quality in local media environments lead to lower total consumer welfare, but these losses decrease with the number of television stations in the market.

Figure 3 plots average consumer welfare per month for all television markets with five stations to 20 stations. The first interesting observation is that the welfare changes from a television station merger are dependent on the number of television stations that existed before the merger. Here, the negative effects from a one-unit decrease in the number of independent television voices on consumer's perception of quality in their local media environments are more pronounced in markets with relatively fewer television stations. As such, the average consumer in a small market, i.e., five television stations, loses $0.11 per month (see also column six of Table 22), whereas the average consumer in a large market, i.e., 20 stations, loses $0.04 per month. As shown in the right-hand panel of Table 22, these losses are equivalent to $6.0 million annually for all small-market households in the U.S. and $1.4 million annually for all large-market households.[37] By summing the individual values in column 10 of Table 22, we that if the merger occurs in all markets, aggregate consumer welfare losses would be about $91 million.

The other interesting observation from the merger analysis is the potential tradeoff between the quality of diversity features and the amount of advertising in local media environments. Both Table 22 and Figure 3 show that consumers lose from the merger because there is less diversity of opinion and less coverage of multiculturalism issues, but they gain

[37] For small markets, $5,975,856 = 4,469,100 × 12 × -0.1114. For large markets, $2,348,092 = 1,391,092 × 12 × -0.0396.

from lower advertising. More specifically, columns seven, eight and nine of Table 22 show that more than 75 percent of the annual consumer losses from less diversity of opinion and multiculturalism in each television market are offset by less exposure to advertising in local media environments.

Finally, we examined how sensitive our results are to an alternative specification of media market structure that controls for the number of daily newspapers in the market (*NEWSPAPERS*), the number of radio stations in the market (*RADIO STATIONS*), the number of households in the market (*HOUSEHOLDS*), and the geographical size of the market in square miles (*AREA*). Specifically, we use the ordered probit model to estimate the effect on product quality, as measured by *DIVERSITY OF OPINION*, *COMMUNITY NEWS*, *MULTICULTURALISM*, or *ADVERTISING* from *TV STATIONS*, *TV VOICES*, *TV STATIONS*× *TV VOICES*, *NEWSPAPERS*, *RADIO STATIONS*, *HOUSEHOLDS* and *AREA*, the vector of demographic controls, X = [*AGE*, *EDUC*, *GENDER*, *INCOME*, *RACE*], and dummy variables that control for the 15 media source combinations. The results from the ordered probit model and the merger analysis, not reported here, have a qualitatively similar pattern to those presented in Table 20 and Table 22.

7. Conclusions

This study examined the effects of media market structure on consumer demand and welfare. A differentiated-product model was used to estimate demand for the local media environment, described by the offerings from newspapers, radio, television, the Internet, and Smartphone. Results show that the representative household is willing to pay $13 per month for different viewpoints in the reporting of information on news and current affairs, and $14 per month for

more information on community news and events. Consumers value more information that reflects the interests of women and minorities, although willingness-to-pay for this is only about $2 per month. Consumers have a distaste for advertising and are willing to pay $8 per month for a decrease in the amount of advertising in their media environment.

We used our demand estimates to calculate the changes to consumer welfare from a merger between two television stations that resulted in quality differences in diversity and advertising in the pre- and post-merger markets. We conducted a simple experiment that simulates the merger by reducing the number of independent television voices in the market by one. The two interesting empirical observations from our analysis are that the consumer welfare effects from a television station merger depend on the number of pre-existing television stations in the market, and there are quality tradeoffs from the changes to product offerings by media outlets in the post-merger markets.

All other things held constant, diversity of opinion, the coverage of multicultural issues, and the amount of advertising decrease following the merger. These changes in quality in local media environments lead to lower consumer welfare, which decreases with the number of television stations in the market. For example, the average consumer in a small market loses $0.11 per month, whereas the average consumer in a large market loses $0.04 per month. These losses are equivalent to $6 million annually for all small-market households in the U.S. and $1.4 million annually for all large-market households. If the merger occurred in all markets, aggregate consumer welfare losses would be about $91 million.

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APPENDIX A: ECONOMETRIC DETAILS

We add subscripts to the random utility model to explicate the econometrics, and indicate choices A and B with numbers 1 and 2. The unobserved utility of media environment $k_{ij} = 1, 2$ to the i^{th}person on the jth choice occasion, $U_{ij}^{k_{ij}}$, is modeled as a linear combination of the choice characteristics and a random error:

$$U_{ij}^{k_{ij}} = \boldsymbol{\beta}' \boldsymbol{x}_{ij}^{k_{ij}} + \epsilon_{ij}^{k_{ij}} \ , \ i = 1, \ldots, n; \ j = 1, \ldots 8, \ k_{ij} = 1, 2 \quad , \tag{A1}$$

where the elements of the vector $\boldsymbol{\beta}$ are the marginal utilities of the elements of the vector $\boldsymbol{x}_{ij}$: *DIVERSITY OF OPINION, COMMUNITY NEWS, MULTICULTURALISM, ADVERTISING,* and *COST* . The disturbances $\epsilon_{ij}^{k_{ij}}$ are assumed to be independent, identically distributed, mean zero normal random variables, uncorrelated with $\boldsymbol{x}_{ij}$, with constant unknown variance σ_ϵ^2. Under these assumptions, the probability of choosing media environment option 1, for example, is:

$$P_{ij}^1 = P(U_{ij}^1 > U_{ij}^2) = \Phi\Big[- \boldsymbol{\beta}'(\boldsymbol{x}_{ij}^2 - \boldsymbol{x}_{ij}^1)/\sqrt{2}\sigma_\epsilon \Big], \tag{A2}$$

and similarly for media environment 2, where $\Phi(\,\cdot\,)$ is the univariate standard normal cumulative distribution function. This is the usual univariate probit model for dichotomous choice, where the unit of observation is an i, j pair. The likelihood is the product of the $8 \times n$ probabilities like equation A1.

After choosing k_{ij}, individuals answer a question stating whether media environment k_{ij} would be chosen over the status quo (as in Figure 2, Question 2). Utility for the status quo, U_i^0 under the model assumption (equation 0) is given by:

$$U_i^0 = \beta_0 + \boldsymbol{\beta}' \boldsymbol{x}_i^0 + \epsilon_i^0 \quad , \tag{A3}$$

where ϵ_i^0 are disturbances and $\boldsymbol{x}_i^0$ are the characteristics of the status quo. We include the constant β_0 and not in the utility of the hypothetical choices to capture the real and psychic costs of switching to a new media environment. The ϵ_i^0 are assumed to be

independent, identically distributed normal random variables with zero expectation and variance σ_0^2, uncorrelated with $\epsilon_{ij}^{k_{ij}}$.

Two choices are then made for each choice occasion. The probability of choosing media environment k_{ij} $(1,2)$ over media environment $3-k_{ij}$ $(2,1)$, and then choosing that alternative over the status quo is the *bivariate* probability:

$$\begin{aligned} &P(U_{ij}^{k_{ij}} > U_{ij}^{3-k_{ij}}, U_{ij}^{k_{ij}} > U_i^0) \\ &= P\Big(\epsilon_{ij}^{3-k_{ij}} - \epsilon_{ij}^{k_{ij}} < -\boldsymbol{\beta}'(\boldsymbol{x}_{ij}^{3-k_{ij}} - \boldsymbol{x}_{ij}^{k_{ij}}), \epsilon_i^0 - \epsilon_{ij}^{k_{ij}} < -\boldsymbol{\beta}'(\boldsymbol{x}_i^0 - \boldsymbol{x}_{ij}^{k_{ij}})\Big) \\ &= \Phi_2\Big[-\boldsymbol{\beta}'(\boldsymbol{x}_{ij}^{3-k_{ij}} - \boldsymbol{x}_{ij}^{k_{ij}})/\sqrt{2}\sigma_\epsilon,\ -\boldsymbol{\beta}'(\boldsymbol{x}_i^0 - \boldsymbol{x}_{ij}^{k_{ij}})/\sqrt{\sigma_0^2+\sigma_\epsilon^2};\ \rho\Big] \end{aligned} \tag{A4}$$

where ρ is the correlation between $\epsilon_{ij}^{3-k_{ij}} - \epsilon_{ij}^{k_{ij}}$ and $\epsilon_i^0 - \epsilon_{ij}^{k_{ij}}$,

$$\rho = \frac{\sigma_\epsilon^2}{\sqrt{2\sigma_\epsilon^2(\sigma_0^2+\sigma_\epsilon^2)}} = \frac{\sigma_\epsilon}{\sqrt{2(\sigma_0^2+\sigma_\epsilon^2)}}, \tag{A5}$$

and Φ_2 is the standard bivariate normal cumulative distribution function. Similar expressions give the probability of choosing media environment k_{ij} over alternative $3-k_{ij}$ and then choosing the status quo over that media environment.

One normalization is required and one additional parameter is identified. Let $\sigma_\epsilon = 1/\sqrt{2}$. Define $\lambda^2 = \sigma_0^2/\sigma_\epsilon^2 = 2\sigma_0^2$. The parameter λ, while not essential to this research, is interesting in its interpretation: the ratio of the variance of the random part of utility in the evaluation of the current forecast to that of the hypothetical forecasts. Then equation A3 can be written:

$$\begin{aligned} &P(U_{ij}^{k_{ij}} > U_{ij}^{3-k_{ij}}, U_{ij}^{k_{ij}} > U_i^0) = \\ &\Phi_2\Big[-\boldsymbol{\beta}'(\boldsymbol{x}_{ij}^{3-k_{ij}} - \boldsymbol{x}_{ij}^{k_{ij}}),\ -\frac{\boldsymbol{\beta}'(\boldsymbol{x}_i^0 - \boldsymbol{x}_{ij}^{k_{ij}})}{\sqrt{(1+\lambda^2)/2}};\ \frac{1}{\sqrt{2(1+\lambda^2)}}\Big]\ . \end{aligned} \tag{A6}$$

The likelihood is again the product of the $8 \times n$ probabilities like equation 5.

To examine WTP estimates, we rewrite the utility model for media environment as:

$$U_{ij}^{*} = \beta_c c_{ij} + \boldsymbol{\beta}_{c'}' \boldsymbol{x}_{ij}^{k_{ij}} + \epsilon_{ij},\ i = 1, \ldots, n;\ j = 1, \ldots, 8. \tag{A7}$$

where c_{ij} is cost and $\boldsymbol{\beta}_{c'}$ is the vector of characteristics of the media environment other than cost. The estimated of WTP for these characteristics are $\widehat{\boldsymbol{w}} = -\widehat{\boldsymbol{\beta}}_{c'}/\widehat{\beta}_c$. Since the estimates of willingness-to-pay are nonlinear function of parameter estimates, their exact standard errors are unknown. While it would be possible to bootstrap the distribution of these estimators, since the normally distributed estimator of β_c is the denominator, the simulation would not converge to anything useful (see Kling and Sexton, 1990; Morey and Waldman, 1994). Instead, we use a linear approximation to the variance (sometimes known as the "delta method"). This approximation for elasticities has been examined in Krinsky and Robb (1986). Let $\widehat{\boldsymbol{\Sigma}}$ be the estimated variance-covariance matrix of $\widehat{\boldsymbol{\beta}}$. The linear approximation to the variance of $\widehat{\boldsymbol{w}}$ is

$$\widehat{V}(\widehat{\boldsymbol{w}}) \approx \left[\frac{\partial \boldsymbol{w}}{\partial \boldsymbol{\beta}}\right]' \widehat{\boldsymbol{\Sigma}} \left[\frac{\partial \boldsymbol{w}}{\partial \boldsymbol{\beta}}\right] \tag{A8}$$

where the derivatives are evaluated at the parameter estimates. The square root of the diagonal elements of $\widehat{V}(\widehat{\boldsymbol{w}})$ are the estimated standard errors of the estimates of WTP. These derivatives are

$$\frac{\partial \widehat{\boldsymbol{w}}}{\partial \widehat{\boldsymbol{\beta}}} = \begin{pmatrix} -\frac{\widehat{\beta}_{a_1}}{\widehat{\beta}_c^2} & \frac{1}{\widehat{\beta}_c} & 0 & 0 & \ldots & 0 \\ -\frac{\widehat{\beta}_{a_2}}{\widehat{\beta}_c^2} & 0 & \frac{1}{\widehat{\beta}_c} & 0 & \ldots & 0 \\ \vdots & \vdots & & \vdots & & \vdots \\ -\frac{\widehat{\beta}_{a_K}}{\widehat{\beta}_c^2} & 0 & 0 & 0 & \ldots & 0 \\ -\frac{\widehat{\beta}_s}{\widehat{\beta}_c^2} & 0 & 0 & 0 & \ldots & \frac{1}{\widehat{\beta}_c} \end{pmatrix} \tag{A9}$$

APPENDIX B: SURVEY QUESTIONS FOR FEATURES AT HOME

Your overall media environment has a monthly cost. This is the total of any monthly subscriptions to newspapers, satellite radio, cable or satellite TV, and the Internet (including the *data feature* of a Smartphone contract), as well as any contributions to public radio or TV.

Some companies bundle TV, the Internet, and/or telephone service into a service plan with a single monthly bill. Do you pay a single monthly bill for a bundle of services? *(mark one answer)*

❍ Yes ❍ No

About how much do you pay per month for paper or online newspapers? *(write "0" if you read free paper or online newspapers)*

$ _____ per month

About how much do you pay per month for satellite radio service?

$ _____ per month

About how much do you pay per month for the TV service at your home? *(If you bundle TV with other services, just write the TV portion of your bundle)*

$ _____ per month

During the past 12 months, about how much did you contribute to public radio stations (e.g., NPR) and/or public TV stations (e.g., PBS)? *(write "0" if you made no contributions)*

$ _____

About how much do you pay per month for the Internet service at your home? *(If you bundle Internet with other services, just write the Internet portion of your bundle)*

$ _____ per month

About how much do you pay per month *for the data feature* of your Smartphone contract? *(If you bundle a Smartphone contract with other services, just write the Smartphone portion of your bundle; write "0" if you do not subscribe to a data feature)*

$ _____ per month

Besides *cost*, there are some other features of your media environment. They are the . . .

(1) *diversity of opinion* in reporting information;
(2) amount of information on *community news* and events;
(3) coverage of *multiculturalism*: i.e. ethnic, gender, and minority related issues; and
(4) amount of *advertising*

We are especially interested in *what is available* in your media environment, rather than what you usually view or listen to. It is possible that your media environment provides you with many different news options. This is what we would like to know, even if you choose to view or listen to the same news programs every day. Please bear this in mind when completing the next four questions.

A *low* *diversity of opinion* media environment provides information on news and current affairs from only one viewpoint. For example, if only a single local newspaper was available, the diversity of opinion from newspapers would be low. In a *medium* *diversity of opinion* environment the information available could come from a few different viewpoints. For example, if you could watch CNN and Fox news for different opinions about a national issue, the diversity of opinion from TV would be medium. As another example, if you could listen to a few radio talk shows with different opinions about an issue, the diversity of opinion from radio would also be medium. A *high* *diversity of opinion* environment provides information from many different viewpoints.

Please indicate the level of diversity of opinion from your overall media environment. *(mark one answer)*

❍ Low ❍ Medium ❍ High

Now consider the information available to you on *community news* and events. Examples are reports on: school sporting results, local council meetings, city/county elections, neighborhood crime, local heroes who give their time to the community, or job layoffs at a local factory.

A media environment with *low* *community news* provides very little or no information on community news and events. For example, if you live in a town without a local newspaper or local TV station, the amount of community news from your media environment may be low. With *medium* *community news*, there is some information on community news and events. With *high* *community news*, there is a lot of information on community news and events.

Please indicate the level of community news from your overall media environment. *(mark one answer)*

❍ Low ❍ Medium ❍ High

Next, consider the information available to you that reflects the interests of women and minorities. We will call this *multiculturalism*. Examples are reports on: Black History month, the Cinco de Mayo celebration, female wage inequality, or programs that help people with disabilities find a job.

A media environment with *low* *multiculturalism* provides very little or no information that reflects the interests of women and minorities. With *medium* *multiculturalism*, the information reflects some of the interests of women and minorities. With *high* *multiculturalism*, the information reflects many of the interests of women and minorities.

Please indicate the level of multiculturalism from your overall media environment. *(mark one answer)*

❍ Low ❍ Medium ❍ High

Finally, consider the amount of *advertising*.

With *low* *advertising*, the amount of space on a newspaper or web page, or the amount of air time devoted to commercial advertising on radio or TV, is barely noticeable. With *medium* *advertising*, the space or time devoted to advertising is more noticeable. With *high* *advertising*, the space or time devoted to advertising is very noticeable, to the point of being annoying when you are viewing or listening to your media source.

Is the advertising in your overall media environment barely noticeable (*Low*), noticeable but not annoying (*Medium*), or annoying (*High*)? *(mark one answer).*

❍ Low ❍ Medium ❍ High

APPENDIX C: FOCUS GROUP INVITATION, PROTOCOLS, QUESTIONS, NOTES

Invitation to a survey "Focus Group"

I will pay you $25, cash, to take a 15 minute survey and then discuss it with me in an informal setting. Total time: about one hour. Refreshments will be provided!

The survey is about your use of newspapers, TV, radio, and the Internet.

Date:_Thursday, December 9, TODAY_

Time:_About 6:10 pm__

Directions: come to Room 5 in the basement of the Economics building (in front and to the left, as you walk to campus through the Broadway underpass at College Ave).

Thanks very much,

Don Waldman
Professor, Department of Economics

Your Name:_____

Telephone #:_____
(I will call you to remind you, if needed)

Miscelleneous comments and issues from focus groups

Opening pages: news stand should be newsstand
newspaper time question: add "(for 1/2 hour, enter .5, for 15 minutes, enter .25, etc.)"

"On a typical day, about how much of the 1 hour do you spend listening to the radio to get information on news and current affairs?" should be "On a typical day, about how much of the 1 hour you spend listening to the radio is to get information on news and current affairs?" Same for TV.

"Answer '2.1' is not in range '0 - 2'. " Sounds like a math lesson. It would be better if it read "You answered that you [listen to radio/watch TV/spend using the Internet] for 2 hours. The amount of time getting news and information from [listen to radio/watch TV/spend using the Internet] must be *less than* 2 hours."

After one prompt that time getting news is too large, go to next question.

Difference between cable and satellite TV important? Does everyone know the difference?

How much do you pay per month *for the data feature* of your Smartphone contract? (Italics needed).

TV and phone bundle: typed 90. TV portion: 99. Took it.

In summary of media env. and follow up questions, round off amount paid to nearest dollar. $159.833333333333 per month

Need to redo design, to eliminate $5 costs for the full environment. Some crazy choices: $5, high, medium, high, medium vs. $180 low, medium, medium, low? Redo by hand.

After WTP question, remind respondent they are comparing the full media environment.

In description of localism, and elsewhere, we have the phrase "from your media environment" which could be dropped.

"All" spelled "Al" in first choice question.

Rewrite descriptions of certainty levels - see Freya's email.

In follow up questions, instead of "I prefer option B", "I prefer option B to my media envirnment," or, "I *still* prefer option B."

"We would like to have your answer to this question" to "We would really like to have your answer to this question"

Number the choice questions, or have a status bar, to let respondent know how much they have to do.

Smartphone question "a Android . . ." should be "an Android . . ."

Add smartphone data contract to intro on cost

How much do you pay per month *for the data feature* of your Smartphone contract? Italics needed. Position of question wrong.

Try Table 1 inputs for differences

Internet capitalized throughout? See intro to choice questions.

"Journalistic viewpoints" ???

"pretty" certain

Need to check the congruency of version number and attribute levels

Ask subjects if they like the text balloons

Tell subjects to ignore the first screen, and the two "Data only" screens that appear later.

Both Dave and Ken had even less trouble with the survey than the women. Ken is a KN panelist. They thought our descriptions and examples were good. They understood the exercise completely. Number of choice questions OK, maybe helps to divide up 4 and 4 with the payment card question. Shading good (Ken), didn't realize (Dave). Cheap talk on taking cost seriously. Some problems with things that will not be a problem with the online version.

Dave was fairly certain about all but one choice, for which he was certain, and Ken was half very certain, half fairly certain; Susan was two very certain, six fairly certain, one somewhat certain; Ann Marie's answers were spread out, although no one had picked the least certain category.

Cost of media environment: Dave: $93, Ken: $25; Ann Marie: $100; Susan: $15

Switch/Stay results:

	Ann Marie	Susan	Ken	Dave
Switch	8	2	0	0
Stay	1	7	9	9

Both Dave and Ken had even less trouble with the survey than the women. Ken is a KN panelist. They thought our descriptions and examples were good. They understood the exercise completely. Number of choice questions OK, maybe helps to divide up 4 and 4 with the payment card question. Shading good (Ken), didn't realize (Dave). Cheap talk

on taking cost seriously. Some problems with things that will not be a problem with the online version.

Dave was fairly certain about all but one choice, for which he was certain, and Ken was half very certain, half fairly certain; Susan was two very certain, six fairly certain, one somewhat certain; Ann Marie's answers were spread out, although no one had picked the least certain category.

Cost of media environment: Dave: $93, Ken: $25; Ann Marie: $100; Susan: $15

Switch/Stay results: Ken would not switch on any choice, which was consistent with his home media environment ($45, Low, High, Medium, High). Dave likewise would not switch, which was inconsistent with one of his choices; Ann Maria switched on all but one; Susan stayed 7 times, switched twice. Susan and Ann Marie were consistent.

Time: about 22 minutes for Ken and Dave.

Media Ownership Study
Focus Group Protocol
Online Administration at RRC Associates, Boulder

We will conduct two focus groups. The first will have five subjects and be administered by and on the premises of RRC Associates of Boulder, CO. The second will have approximately 10 subjects and be in the computer lab of the Economics building at the University of Colorado.

First focus group

Subjects for the first focus group will be recruited by RRC from the general population of Boulder County to be heterogenous with respect to gender, age, income, and education. They are paid approximately $50 for their participation. As in the survey, they will be asked to bring with them any media bills that they have on hand. We will sit behind a one-way mirror observing the session. At any point we can interrupt. In the past we have usually waited until the end of the session to introduce ourselves as the researchers and ask any questions that may have arisen during the survey. The entire session is recorded on a DVD for further study.

Before the subjects arrive we meet with the facillitator to review the survey and discuss our general objectives and goals for the session. The facillitator has previously had access to the survey and our list of questions. They provide input on their role in the procedure.

Format

Subjects come to RRC's offices and meet with the facillitator. They sit in a small room at a desk with a computer, with the facillitator sitting next to them. The instructions spoken by the facillitator are approximately:

"Imagine you have agreed to take a short survey on the Internet. Proceed through the survey as you would at home. From time to time I will ask for your reactions to some of the questions. At any point while taking the survey, please tell me if you are unsure of what any question is asking."

Questions

Particular questions that the facillitator will ask. Here the format is somewhat freewheeling. The facillitator is allowed to follow up on responses, and to tailor questions to individuals.

1. After the section of the survey "Sources of Information:" "How difficult was it for you to estimate the number of hours you spend each week using the different media sources? Would anything make it easier for you to guess at the answers to these questions?"

2. After the section of the survey "Cost of Your Media Environment:" "How certain were you about the dollar amounts you entered? Do you think you were able to differentiate any combined bills you may have for TV, the Internet, etc."

3. After they read the information under "Features of Your Media Environment:" "Is it clear to you what we mean by 'features of your media environment?' "

4. After Q39: "We asked for a lot of information in this question! We're you able to figure out how to mark the table? Do you think you were able in your answers to distinguish the amount of advertising in the different sources, or do you think you kind of generally answered from your overall feeling about the amount of advertising you see or hear?"

5. After Q40,if they checked "No": "Did we miss by much?" "Were you at all put off by us for telling you what we thought your overall advertising exposure was?" If they checked "Yes": "Do you really think we got it about right, or were you not sure and you were you just agreeing?"

6. After Q42: "Is it clear what we mean by diversity of opinion?" Again, how difficult was it for you to distinguish the levels of diversity for the four media sources?"

7. Question 6 is repeated for the features *localism* (Q45-47) and *multiculturism* (Q48-50).

8. After Q51: "Is it clear what we are asking here?" Probing: "instead of the levels of the attributes advertising, etc., we are now inquiring about your level of satisfaction with the features. Was that clear to you? Do you think this question is burdensome?"

9, After they have viewed Table 3, with time to roll their mouse pointer over a feature of a level: "Do you think you have a good feel for what we mean by your media environment? Do you have a good idea of what your own media environment is like from answering all these questions?"

10. After Q52: "Is it clear what you are choosing in this question? How difficult was it for you to decide between the two choices? Did either environment appeal to you?"

Then, if they had to be prompted to make a choice: "Would you have liked to skip this question? After the question returned to the screen, did you simply mark a choice to move on, or would you really prefer the choice you were given?"

11. This line of questioning is repeated after Q53.

12. Now we let recruits answer a few more choice questions, and then ask them again questions like 10. This is repeated once more toward or at the end of the eight questions.

13. After the end of the choice questions: "Did you feel there were too many of these choices to make? Were you thinking as hard as you were in the beginning when you made these choices?"

14. After Q70: "Was it clear what we were asking for in this question? You answered eight choice questions before this one. What are your thoughts on the following: you answer four choice questions, then this one, then four more choice questions. Would that have made any difference for you?"

Second Focus Group

This is a different approach altogether. We recruit 10 or so people, paying $25/person, some students, some other campus area people (secretaries, professors, shop keepers in the immediate campus area). They all sit at the computer and take the survey uninterrupted, at the same time. After they are finished answering the questions . . .

At the conclusion of the survey, they write their remarks on any aspect of the survey. We prompt them with a screen of issues to guide their remarks.

APPENDIX D: PANEL RECRUITMENT AND NON-RESPONSE[38]

D1. Panel Recruitment

KN panel members are recruited by either formerly random digit dialing (RDD) sampling or the current address-based sampling (ABS) methodologies. To offset attrition, multiple recruitment samples are fielded evenly throughout the calendar year.

Random digit dialing

KN's recruitment methodology has used the standards established by selected RDD surveys conducted for the Federal government, such as the CDC-sponsored National Immunization Survey. KN employed list-assisted RDD sampling techniques based on a sample frame of the U.S. residential landline telephone universe. For purposes of efficiency, KN excludes only those banks of telephone numbers (a bank consists of 100 numbers) that had fewer than two directory listings. Additionally, an oversampling was conducted within a stratum of telephone exchanges that had high concentrations of African American and Hispanic households based on Census data.

A telephone number for which a valid postal address can be matched occurred in about 67 to 70 percent of each sample. These address-matched cases were all mailed an advance letter informing them that they had been selected to participate in KN's panel. Following the mailings, telephone recruitment by trained interviewers begins for all sampled telephone numbers. All members of the household are enumerated, and some initial demographic and background information on prior computer and Internet use was collected.

[38] Documentation on KN's sampling, data collection procedures, weighting, and IRB-bearing issues are available at: http://www.knowledgenetworks.com/ganp/reviewer-info.html; http://www.knowledgenetworks.com/knpanel/index.html; and http://www.knowledgenetworks.com/ganp/irbsupport/.

Households with a home computer and Internet access were asked to take KN surveys using their own equipment and Internet connection. Households without Internet access are provided with a laptop computer and free monthly Internet access. Each computer is custom-configured prior to shipment with individual email accounts so that it is ready for immediate use by the household. Most households are able to install the hardware without additional assistance, although KN maintains a toll-free telephone line for technical support.

Once a household is recruited and each household member's e-mail address is either obtained or provided, panel members are sent survey invitations linked through a personalized e-mail message. This permits surveys to be fielded quickly and economically, and also facilitates longitudinal research. In addition, this approach reduces the burden placed on respondents, since e-mail notification is less intrusive than telephone calls and allows research subjects to participate in research when it is convenient for them.

Address-Based Sampling

In 2009, Knowledge Networks introduced the ABS sample frame to panel recruitment to reflect the recent changes in society and telephony. These changes, which have reduced the long-term scientific viability of landline RDD sampling methodology, are: declining respondent cooperation in telephone surveys as reflected in "do not call" lists, call screening, caller-ID devices, and answering machines; dilution of the RDD sample frame as measured by the working telephone number rate; and the emergence of cell phone-only households which are excluded from the RDD frame.

ABS involves probability-based sampling of addresses from the U.S. Postal Service's Delivery Sequence File. Randomly sampled addresses are invited to join the KN panel through

a series of mailings and, in some cases, telephone follow-up calls to non-responders when a telephone number can be matched to the sampled address. Operationally, invited households have the option to join the panel by one of several ways: completing and returning a paper form in a postage-paid envelope; calling a toll-free hotline maintained by KN; or going to a dedicated KN web site and completing an online recruitment form.

After initially accepting the invitation to join the panel, respondents are then "profiled" online by answering key demographic questions about themselves. This profile is maintained through the same procedures that were established for RDD-recruited panel members.

D2. Non-Response Bias

Multivariate Analysis of Survey Non Response

Table D1 presents summary statistics for the gross sample of 8,621 panel members invited to participate in the media environment survey. Column two and column three of Table D2 report the estimates from the probit model that relates *FULL SAMPLE* (equals one if the respondent participated in the survey and zero otherwise) to selected demographic and regional variables Column four and five of Table D2 report the estimates from the probit model that relates *FINAL SAMPLE* (equals one if the respondent is included in the final sample and zero otherwise) to selected demographic and regional variables. The results indicate potential differences in age, gender, education and Internet access between our final sample and the population. We remedy this possible source of bias in our results in Section 5 by estimating with weighted maximum likelihood, where the contribution to the log likelihood is the post-stratification weight times the log of the bivariate probability for the individual choice occasion.

Sample Weights

Post-stratification weights were used to adjust sample estimates for any survey non-response, as well as any non-coverage or under- and over-sampling resulting from the study-specific sample design. Demographic and geographic distributions for the non-institutionalized, civilian population ages 18 and over from the most recent CPS were used as benchmarks in this adjustment. The benchmark distributions used for the post-stratification adjustment are: age/gender (18 to 29 years male, 18 to 29 years female, 30 to 44 years male, 30 to 44 years female, 45 to 59 years male, 45 to 59 years female, 60 years and over male, and 60 years and over female); race/ethnicity (White/non-Hispanic, Black/non-Hispanic, other/non-Hispanic, two or more races/non-Hispanic, Hispanic); education (less than high school, high school, some college, bachelor degree and beyond); census region/metropolitan area (northeast metro, northeast non-metro, midwest metro, midwest non-metro, south metro, south non-metro, west metro, west non-metro); and Internet Access (yes, no).

Comparable distributions were calculated by using all completed cases from the field data minus the dropped interviews (i.e., n = 5,131). Since study sample sizes are typically too small to accommodate a complete cross-tabulation of all the survey variables with the benchmark variables, a raking procedure is used for the post-stratification weighting adjustment. Using the base weight as the starting weight, this procedure adjusts the sample data back to the selected benchmark proportions.[39] Through an iterative convergence process, the weighted sample data are optimally fitted to the marginal distributions. After this final

[39] The KN panel sample has several known sources of deviation from an equal probability of selection design. These are corrected in the base weight and are: under-sampling of telephone numbers unmatched to a valid mailing address; RDD selection proportional to the number of telephone landlines reaching the household; oversampling of Chicago and Los Angeles in early pilot surveys; early oversampling the four largest states and central region states; under-sampling of households not covered by the MSN® TV service network; RDD oversampling of African American and Hispanic telephone exchanges; and ABS phone match adjustment and oversample stratification adjustment.

post-stratification adjustment, the distribution of the calculated weights are examined to identify and, if necessary, trim outliers at the extreme upper and lower tails of the weight distribution. The post-stratified and trimmed weights are then scaled to the sum of the total sample size of all eligible respondents.

Table D1. Summary Statistics for KN Gross Sample

Demographic	Description	Obs	Mean	s.d.	Min	Max
FULL SAMPLE	1 if the respondent is in the full sample, 0 otherwise.	8,621	0.644	0.479	0	1
AGE	1 if 18-24 years; 2 if 25-34; 3 if 35-44; 4 if 45-54; 5 if 55-64; 6 if 65-74; 7 if 75 years or over.	8,621	3.815	1.686	1	7
RACE	1 if white; 0 otherwise.	8,621	0.697	0.459	0	1
GENDER	1 if female; 0 otherwise.	8,621	0.530	0.499	0	1
MARITAL STATUS	1 if married; 0 otherwise.	8,621	0.535	0.499	0	1
EDUCATION	1 if less than high school; 2 if high school; 3 if some college; 4 if bachelors degree or more.	8,621	2.783	0.982	1	4
HOUSEHOLD INCOME	1 if less than $10,000; 2 if $10,000-$24,999; 3 if 25,000-$49,999; 4 if $50,000-$74,999; 5 if $75,000 or more.	8,621	3.593	1.293	1	5
EMPLOYMENT	1 if in work force; 0 otherwise.	8,621	0.568	0.495	0	1
INTERNET	1 if Internet access is *not* provided by KN, 0 otherwise.	8,621	0.800	0.400	0	1
NORTHEAST	1 if respondent resides in the Northeast census region; 0 otherwise.	8,621	0.180	0.385	0	1
MIDWEST	1 if respondent resides in the Midwest census region; 0 otherwise.	8,621	0.234	0.424	0	1
SOUTH	1 if respondent resides in the South census region; 0 otherwise.	8,621	0.356	0.479	0	1
WEST	1 if respondent resides in the West census region; 0 otherwise.	8,621	0.229	0.420	0	1

NOTES. Obs is number of observations. s.d. is standard deviation. Min is minimum value. Max is maximum value.

Table D2. Probit Estimates of Gross Sample Respondents

	Full sample		Final sample	
	dF/dx	|z|	dF/dx	|z|
AGE	0.041***	12.07	0.060***	16.93
RACE	0.095***	8.00	0.095***	7.80
GENDER	-0.053***	5.08	-0.043***	3.92
MARITAL STATUS	-0.013	1.14	-0.010	0.81
EDUCATION	0.013**	2.25	0.016**	2.67
HOUSEHOLD INCOME	0.001	0.83	0.002	0.38
EMPLOYMENT	-0.031***	2.69	-0.021*	1.75
INTERNET	0.053***	3.53	0.035**	2.28
NORTHEAST	0.008	0.65	-0.000	0.01
MIDWEST	0.023	1.47	0.031**	1.96
SOUTH	-0.015	1.06	-0.005	0.34
Likelihood	-5,435.6		-5,559.8	
Observations	8,261		8,261	

NOTES. "Full sample" equals one when the respondent participated in the survey, zero otherwise. "Final sample" equals one when the respondent is included in the final sample for analysis. dF/dx is the effect of a marginal change in the independent variable on the probability of being in the final sample. z is the z value, calculated from robust standard errors. ***denotes significant at the one percent level. **denotes significant at the five percent level. *denotes significant at the ten percent level.

APPENDIX E. MEDIA MARKET STRUCTURE VARIABLES

Variable	Description
HOUSEHOLDS	Households in the market.
NEWSPAPERS	Number of daily newspapers with a city of publication located in a county in the market.
RADIO STATIONS	Number of radio stations in the market.
TV STATIONS	Number of television stations in the market.
MEDIA OUTLETS	NEWSPAPERS plus RADIO STATIONS plus TV STATIONS.
NEWSPAPER VOICES	Number of parent entities owning a daily newspaper in the market.
RADIO VOICES	Number of independent radio voices in the market.
TV VOICES	Number of independent television voices in the market.
VOICES	NEWSPAPER VOICES plus RADIO VOICES plus TELEVISION VOICES.
TV-NEWSPAPER VOICES	Number of independent newspaper and television voices in the market.
TV-RADIO VOICES	Number of independent radio and television voices in the market.

NOTES. All data are from the FCC (2011).

Table 1. Media Environment Features

Characteristic	Levels
COST	The total of monthly subscriptions to all of the household's media sources, plus any contributions to public radio or public TV stations (ranging from $0 to $250 per month).
DIVERSITY OF OPINION	The extent to which the information on news and current affairs in the household's overall media environment reflects different viewpoints. Low: only one viewpoint. Medium: a few different viewpoints. High: many different viewpoints.
COMMUNITY NEWS	The amount of information on community news and events in the household's overall media environment. Low: very little or no information on community news and events. Medium: some information on community news and events. High: much information on community news and events.
MULTICULTURALISM	The amount of information on news and current affairs in the household's overall media environment that reflects the interests of women and minorities. Low: very little or no information reflecting the interests of women and minorities. Medium: some information reflecting the interests of women and minorities. High: much information reflecting the interests of women and minorities.
ADVERSTISING	The amount of space and/or time devoted to advertising in the household's overall media environment. Low: barely noticeable. Medium: noticeable but not annoying. High: annoying.

Table 2. Demographic Distributions (%)

	Census	KN panel	KN sample			
			Gross sample (Invited)	Full sample (Completed)	Final sample (Completed)	Omitted (Completed)
Region						
Northeast	18.4	18.5	18.0	18.5	18.3	21.8
Midwest	21.8	22.1	23.4	24.7	24.9	21.3
South	36.5	35.9	35.6	34.2	34.4	31.4
West	23.2	23.5	22.9	22.6	22.4	25.4
Age						
18-24 years	12.6	10.7	10.7	8.6	7.6	21.8
25-34 years	17.8	17.4	15.0	12.7	11.3	29.7
35-44 years	17.8	18.9	16.6	16.1	15.8	20.1
45-54 years	19.5	18.5	20.1	20.3	20.9	13.2
55-64 years	15.5	18.5	20.3	22.2	23.3	9.1
65 years or over	16.8	16.0	17.3	20.1	21.2	6.0
Race						
Non-white	18.9	20.9	30.3	26.0	25.4	33.3
White	81.1	79.1	69.7	74.0	74.6	66.7
Gender						
Female	51.7	52.6	53.0	50.8	51.1	47.5
Male	48.3	47.4	47.0	49.2	49.9	52.5
Marital status						
Married	55.1	52.5	53.5	55.1	55.8	46.3
Not married	44.9	47.5	46.5	44.9	44.2	53.7
Education						
< High school	13.8	12.9	10.8	9.6	9.5	10.8
High school	30.7	29.6	29.0	30.2	30.0	32.6
Some college	28.2	29.1	31.3	29.8	30.0	27.6
Bachelors degree or higher	27.4	28.3	28.9	30.4	30.5	29.0
Household income						
< $10,000	6.6	7.0	7.1	6.3	6.3	6.7
$10,000-$24,999	16.8	16.1	15.1	14.4	14.3	14.6
$25,000-$49,999	26.2	26.1	24.3	24.8	24.6	27.1
$50,000-$74,999	19.5	20.3	18.3	18.8	19.1	15.9
> $75,000-	30.8	30.4	35.2	35.7	35.7	35.7
Employment						
In labor force	66.1	67.3	56.8	55.2	54.7	60.7
Not in labor force	33.9	32.7	43.2	44.8	45.3	39.3
Internet access	64.0	66.0	73.0	81.2	80.6	88.2
Observations	n.a.	n.a.	8,621	5,548	5,131	417

NOTES. Census data are from December, 2009. KN panel data are from January, 2010. Remaining data are from March, 2011.
SOURCE. United States Census Bureau (2009); Knowledge Networks, Inc. (2010).

Table 3. Summary Statistics for Media Environment Sources

Media source	Obs	Sample share (%)	Mean	s.d.	Min	Max
Newspaper	2,342	45.6	1.015	1.766	0	24
Radio	4,154	81.2	1.423	1.873	0	24
Satellite radio	558	10.9	1.522	2.221	0	24
Television	4,856	94.6	1.953	2.172	0	24
Cable television	2,736	53.4	1.976	2.210	0	24
Satellite television	1,381	27.0	2.071	2.197	0	24
Own Internet	4,135	80.6	1.074	1.659	0	24
Smartphone	1,270	24.8	0.580	1.344	0	24

NOTES. Obs is number of observations. Sample share is the percentage of the sample that uses the media source. s.d. is standard deviation. Min is minimum value. Max is maximum value. Own Internet is home Internet service not provided by KN.

Table 4. Distribution of Media Source Combinations

Newspaper	Radio	Television	Internet	Smartphone	Count	Sample share (%)
✓			✓	✓	7	0.1
			✓	✓	8	0.2
✓			✓		15	0.3
✓	✓		✓	✓	21	0.4
	✓		✓	✓	29	0.6
			✓		56	1.1
✓	✓		✓		59	1.1
✓		✓	✓	✓	56	1.1
	✓		✓		80	1.6
		✓	✓	✓	87	1.7
✓		✓	✓		336	6.5
		✓	✓		411	8.0
✓	✓	✓	✓	✓	504	9.8
	✓	✓	✓	✓	558	10.9
✓	✓	✓	✓		1,345	26.2
	✓	✓	✓		1,559	30.4

NOTES. 5,131 observations. Count is the number of respondents that use the media source or combination of media sources. Sample share is the percentage of the sample that use the media source or combination of media sources.

Table 5. Summary Statistics for Levels of Media Environment Features

Feature	Obs	Mean	s.d.	Min	Max
DIVERSITY OF OPINION	5,131	2.09	0.655	1	3
COMMUNITY NEWS	5,131	1.99	0.711	1	3
MULTICULTURALISM	5,131	1.83	0.705	1	3
ADVERTISING	5,131	2.29	0.682	1	3
COST ($ per month)	5,131	111.2	76.03	0	447
CONTRIBUTION ($ annual)	535	111.5	161.5	0.25	1,500
BUNDLE	3,688	0.576	0.494	0	1

NOTES. 1 = “low”, 2 = “medium” and 3 = “high” for DIVERSITY OF OPINION, COMMUNITY NEWS, MULTICULTURALISM, and ADVERTISING. CONTRIBUTION is value of contributions to public radio and public television stations during the past 12 months. BUNDLE = 1 when subscription television service is bundled with Internet service and/or other telephone services. Obs is number of observations. s.d. is standard deviation. Min is minimum value. Max is maximum value.

Table 6. Distribution of Satisfaction with Media Environment Features

Feature	Obs	Not satisfied 1.	2.	3.	4.	Very Satisfied 5.
DIVERSITY OF OPINION	5,128	3.1 %	7.4 %	40.1 %	30.2 %	19.2 %
COMMUNITY NEWS	5,128	2.7 %	9.2 %	35.0 %	33.0 %	20.1 %
MULTICULTURALISM	5,127	3.2 %	9.6 %	42.6 %	27.5 %	17.0 %
ADVERTISING	5,124	15.0 %	23.3 %	37.5 %	15.7 %	8.5 %
COST	5,126	14.9 %	25.8 %	35.6 %	13.1 %	10.7 %
OVERALL ENVIRONMENT	5,125	2.8 %	8.0 %	44.9 %	31.0 %	13.1 %

NOTES. Data are from responses to the question: your media environment provides you with information on news and current affairs from the following sources; [INSERT TEXT FROM LOOKUP TABLE 2]. On a scale from 1 to 5, with 1 indicating "not satisfied" and 5 indicating "very satisfied", how satisfied are you with each feature? Also, how satisfied are you with your overall media environment? Obs is number of observations. All other cells are percent of respondents indicating 1, 2, 3, 4, and 5.

Table 7. Summary Statistics for Satisfaction with Media Environment Features

Feature	Obs	Mean	s.d.	Min	Max
DIVERSITY OF OPINION	5,128	3.55	0.983	1	5
COMMUNITY NEWS	5,128	3.59	0.994	1	5
MULTICULTURALISM	5,127	3.46	0.987	1	5
ADVERTISING	5,124	2.80	1.135	1	5
COST	5,126	2.79	1.169	1	5
OVERALL ENVIRONMENT	5,125	3.43	0.916	1	5

NOTES. Data are from responses to the question: your media environment provides you with information on news and current affairs from the following sources; [INSERT TEXT FROM LOOKUP TABLE 2]. On a scale from 1 to 5, with 1 indicating "not satisfied" and 5 indicating "very satisfied", how satisfied are you with each feature? Also, how satisfied are you with your overall media environment? Obs is number of observations. s.d. is standard deviation. Min is minimum value. Max is maximum value.

Table 8. Summary Statistics for Media Market Structure

Variable	Markets	Mean	s.d.	Min	25th	75th	Max
All markets							
HOUSEHOLDS	203	1,670,158	1,842,396	4,145	447,396	2,228,143	7,444,659
SMALL MARKETS	203	0.084	0.278	0	n.a.	n.a.	1
MEDIA OUTLETS	203	138.7	71.25	4	80	182	291
VOICES	203	73.11	35.97	3	44	97	152
NEWSPAPERS	203	12.76	8.206	0	6	19	32
RADIO STATIONS	203	113.2	59.41	3	64	157	241
TV STATIONS	203	12.74	5.879	1	8	17	27
NEWSPAPER VOICES	203	7.634	4.076	0	4	10	19
RADIO VOICES	203	55.12	28.75	2	31	73	119
TV VOICES	203	10.36	4.626	1	7	13	22
TV-NEWSPAPER VOICES	203	11.91	4.758	1	8	15	24
TV-RADIO VOICES	203	63.06	30.95	2	38	85	129
Small markets (five or less television stations)							
HOUSEHOLDS	68	195,814	98,806	4,145	116,273	264,844	395,620
MEDIA OUTLETS	68	46.97	15.90	4	37	57	86
VOICES	68	26.36	8.695	3	20	34	41
NEWSPAPERS	68	4.160	2.347	0	2	6	11
RADIO STATIONS	68	38.60	13.85	3	30	48	75
TV STATIONS	68	4.211	1.060	1	4	5	5
NEWSPAPER VOICES	68	3.308	1.900	0	2	4	8
RADIO VOICES	68	19.00	6.608	2	14	25	31
TV VOICES	68	4.046	1.097	1	3	5	5
TV-NEWSPAPER VOICES	68	5.734	1.302	1	5	7	8
TV-RADIO VOICES	68	22.54	7.316	2	17	28	35

NOTES. Markets is the number of television markets. s.d. is standard deviation. Min is minimum value. Max is maximum value. 25th is 25th percentile. 75th is 75th percentile. 5,123 observations are used to calculate summary statistics for all markets. 432 observations are used to calculate summary statistics for small markets. n.a. is not applicable.

Table 9. Ordered Probit Estimates of Media Environment Satisfaction and Television Market Structure

	DIVERSITY OF OPINION	COMMUNITY NEWS	MULTI-CULTURALISM	ADVERTISING	OVERALL MEDIA ENVIRONMENT
TV STATIONS	-0.016	-0.001	-0.021*	-0.016	0.0003
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
TV VOICES	0.026	0.011	0.040**	0.021	-0.004
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
TV STATIONS	0.0001	-0.0005	-0.0003	-0.00004	0.0001
×TV VOICES	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
AGE	0.041***	0.044***	0.035***	-0.043***	0.017*
	(0.009)	(0.009)	(0.009)	(0.009)	(0.090)
EDUC	0.083***	0.002	0.044***	-0.041**	0.003
	(0.017)	(0.016)	(0.016)	(0.016)	(0.017)
GENDER	0.014	0.033	-0.013	0.073**	0.063**
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
INCOME	0.004	-0.013	0.014	-0.026**	-0.027**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
RACE	0.098***	-0.093***	0.136***	-0.223***	-0.055
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Likelihood	-6,817.3	-6,935.1	-6,919.3	-7,511.8	-6,610.0
Observations	5,120	5,120	5,119	5,116	5,117
Markets	203	203	203	203	203

NOTES. The values for each dependent variable, DIVERSITY OF OPINION, COMMUNITY NEWS, MULTICULTURALISM, ADVERTISING and OVERALL MEDIA ENVIRONMENT are 1 through 5, with 1 indicating "not satisfied" and 5 indicating "very satisfied." Markets is the number of television markets. Coefficient estimates for the 15 media source combination dummy variables are not reported. Estimated by weighted maximum likelihood. Standard errors in parentheses. ***denotes significant at the one percent level. **denotes significant at the five percent level. *denotes significant at the ten percent level.

Table 10. Baseline Estimates of Utility

	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.160	44.83	$13.06	$1.35
COMMUNITY NEWS	0.171	50.45	$13.95	$1.35
MULTICULTURALISM	0.022	6.18	$1.82	$1.30
ADVERTISING	-0.100	23.37	$8.18	$1.33
COST	-0.012	129.7		
CONSTANT	0.319	35.21		
λ	1.487	67.53		
Likelihood	-1.092			
Respondents	5,131			
Observations				

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 11. Probit Model Estimates of Utility

	Bivariate Probit Model (A vs. B & A or B vs. SQ data)				Probit Model (A vs. B data)			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.160	44.83	$13.06	$1.35	0.116	15.85	$11.35	
COMMUNITY NEWS	0.171	50.45	$13.95	$1.35	0.145	21.58	$14.21	$1.40
MULTICULTURALISM	0.022	6.18	$1.82	$1.30	0.031	4.65	$3.04	$1.39
ADVERTISING	-0.100	23.37	$8.18	$1.33	-0.118	18.08	$11.55	
COST	-0.012	129.7			-0.010	94.58		
CONSTANT	0.319	35.21						
λ	1.487	67.53						
Likelihood	-1.092				-0.258			
Respondents	5,131							
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 12. Bivariate Probit Model Estimates of Utility for Choice Questions 1-4 and 5-8

	Questions 1-4				Questions 5-8			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.159	32.71	$12.67	$0.96	0.172	30.44	$14.65	$0.96
COMMUNITY NEWS	0.197	44.05	$15.77	$0.96	0.129	24.56	$10.92	$0.95
MULTICULTURALISM	0.023	4.191	$1.87	$0.93	0.008	1.585	$0.67	$0.78
ADVERTISING	-0.087	13.83	$6.91	$0.94	-0.121	20.07	$10.28	$0.94
COST	-0.013	90.44			-0.012	-7.62		
CONSTANT	0.323	24.75			0.322	26.08		
λ	1.560	48.90			1.378	44.40		
Likelihood	-1.072				-1.111			
Respondents	5,131				5,131			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 13. Estimates of Utility by Age

	18 to 29 years				30 to 44 years			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.169	26.18	$12.16	$0.86	0.144	21.84	$11.53	$0.73
COMMUNITY NEWS	0.125	19.83	$8.96	$0.85	0.142	22.69	$11.43	$0.73
MULTICULTURALISM	0.036	5.45	$2.58	$0.83	0.031	4.72	$2.52	$0.71
ADVERTISING	-0.091	11.64	$6.51	$0.84	-0.068	8.45	$5.48	$0.71
COST	-0.014	81.40			-0.012	75.87		
CONSTANT	0.330	20.31			0.264	15.44		
λ	1.503	42.98			1.396	36.62		
Likelihood	-1.771				-1.276			
Respondents	678				1,100			
Observations								
	45 to 59 years				60 years or more			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.155	20.46	$12.59	$0.67	0.176	21.21	$16.39	$0.49
COMMUNITY NEWS	0.182	25.73	$14.79	$0.67	0.223	28.22	$20.78	$0.49
MULTICULTURALISM	0.025	3.28	$2.05	$0.64	-0.004	0.47		
ADVERTISING	-0.116	12.82	$9.43	$0.66	-0.135	13.55	$12.59	$0.48
COST	-0.012	60.13			-0.011	47.02		
CONSTANT	0.330	20.31			0.264	15.44		
λ	0.358	19.37			0.339	15.48		
Likelihood	-0.900				-0.877			
Respondents	1,540				1,643			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 14. Estimates of Utility by Education

	Less Than High School				High School Diploma			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.057	6.34	$3.98	$0.70	0.098	15.23	$7.53	$0.77
COMMUNITY NEWS	0.128	15.38	$8.91	$0.70	0.195	31.58	$14.92	$0.77
MULTICULTURALISM	-0.014	1.63			0.007	1.02	$0.51	$0.59
ADVERTISING	-0.050	4.66	$3.49	$0.68	-0.085	11.04	$6.52	$0.75
COST	-0.014	58.40			-0.013	76.83		
CONSTANT	0.389	18.98			0.348	20.43		
λ	1.509	30.06			1.680	41.09		
Likelihood	-1.479				-1.148			
Respondents	486				1,538			
Observations								
	Some College				College Degree			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.168	24.22	$13.83	$0.66	0.276	37.78	$24.91	$0.59
COMMUNITY NEWS	0.175	25.96	$14.41	$0.66	0.172	25.63	$15.52	$0.59
MULTICULTURALISM	0.029	4.02	$2.36	$0.65	0.060	8.42	$5.44	$0.59
ADVERTISING	-0.126	14.85	$10.39	$0.65	-0.104	12.21	$9.42	$0.58
COST	-0.012	67.20			-0.011	59.30		
CONSTANT	0.284	15.49			0.240	12.68		
λ	1.484	35.34			1.372	30.31		
Likelihood	-1.019				-0.966			
Respondents	1,540				1,567			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 15. Estimates of Utility by Income

	Low Income < $25,000				$25,000 ≤ Middle Income < $75,000				$75,000 ≤ High Income			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.098	14.86	$6.19	$1.21	0.158	29.11	$11.82	$0.91	0.224	31.82	$23.11	$0.36
COMMUNITY NEWS	0.155	25.13	$9.83	$1.21	0.183	35.15	$13.74	$0.91	0.174	26.19	$17.90	$0.36
MULTICULTURALISM	0.013	1.97	$0.82	$0.99	0.034	6.20	$2.55	$0.89	0.015	2.12	$1.54	$0.35
ADVERTISING	-0.063	7.93	$3.97	$1.15	-0.097	15.08	$7.28	$0.89	-0.133	15.34	$13.67	$0.35
COST	-0.016	76.90			-0.013	92.80			-0.010	60.08		
CONSTANT	0.551	42.64			0.252	17.15			0.034	1.26		
λ	1.236	35.31			1.564	48.61			1.780	30.73		
Likelihood	-1.342				-1.076				-0.932			
Respondents	1.058				2,241				1,820			
Observations												

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 16. Estimates of Utility by Gender

	Female				Male			
	MU	T	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.155	31.02	$12.75	$0.90	0.165	32.53	$13.41	$1.01
COMMUNITY NEWS	0.176	36.91	$14.42	$0.90	0.166	34.49	$13.49	$1.01
MULTICULTURALISM	0.037	7.26	$3.03	$0.89	0.007	1.47	$0.61	$0.81
ADVERTISING	-0.092	15.08	$7.52	$0.89	-0.109	-18.06	$8.84	$1.00
COST	-0.012	92.02			-0.012	-91.72		
CONSTANT	0.297	22.06			0.340	27.96		
λ	1.602	49.55			1.371	45.22		
Likelihood	-1.113				-1.070			
Respondents	2,620				2,511			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 17. Estimates of Utility by Race

	White				Non White			
	MU	t	WTP	s.e.	MU	t	WTP	s.e.
DIVERSITY OF OPINION	0.176	37.99	$14.39	$0.98	0.127	22.67	$10.34	$0.94
COMMUNITY NEWS	0.184	41.74	$15.02	$0.98	0.143	26.87	$11.62	$0.93
MULTICULTURALISM	0.005	1.01	$0.39	$0.69	0.059	10.37	$4.78	$0.92
ADVERTISING	-0.114	20.44	$9.32	$0.97	-0.066	9.80	$5.38	$0.91
COST	-0.012	100.5			-0.012	82.31		
CONSTANT	0.287	23.04			0.376	28.60		
λ	1.524	52.39			1.445	42.90		
Likelihood	-1.072				-1.386			
Respondents	3,826				1,305			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 18. Estimates of Utility by Gender and Race

	White Male				Non-White Male			
	MU	t	WTP	s.e.	MU	T	WTP	s.e.
DIVERSITY OF OPINION	0.171	25.55	$13.66	$0.72	0.157	19.99	$13.06	$0.71
COMMUNITY NEWS	0.186	29.20	$14.84	$0.72	0.127	17.20	$10.64	$0.71
MULTICULTURALISM	-0.010	1.449			0.042	5.25	$3.48	$0.70
ADVERTISING	-0.122	15.10	$9.75	$0.71	-0.077	8.37	$6.44	$0.70
COST	-0.013	70.97			-0.011	56.65		
CONSTANT	0.298	17.25			0.412	24.55	34.42	
λ	1.436	35.16			1.275	28.02		
Likelihood	-0.959				-1.390			
Respondents	1,871				620			
Observations								
	White Female				Non-White Female			
	MU	t	WTP	s.e.	MU	T	WTP	s.e.
DIVERSITY OF OPINION	0.182	28.15	$15.10	$0.67	0.098	12.15	$7.77	$0.61
COMMUNITY NEWS	0.183	29.86	$15.21	$0.67	0.160	20.85	$12.68	$0.61
MULTICULTURALISM	0.018	2.78	$1.52	$0.64	0.078	9.58	$6.16	$0.61
ADVERTISING	-0.106	13.73	$8.83	$0.66	-0.056	5.63	$4.42	$0.59
COST	-0.012	71.07			-0.013	59.42		
CONSTANT	0.276	15.34			0.338	16.49		
λ	1.613	38.10			1.609	32.12		
Likelihood	-1.019				-1.380			
Respondents	1,995				665			
Observations								

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 19. Estimates of Utility with Non-Linear Preferences

	MU	t	WTP	s.e.
MEDIUM DIVERSITY OF OPINION	0.240	33.85	$18.86	$1.34
HIGH DIVERSITY OF OPINION	0.322	44.50	$25.28	$1.33
MEDIUM COMMUNITY NEWS	0.261	35.35	$20.54	$1.34
HIGH COMMUNITY NEWS	0.343	50.20	$26.93	$1.33
MEDIUM MULTICULTURALISM	0.051	7.25	$4.03	$1.31
HIGH MULTICULTURALISM	0.050	6.93	$3.96	$1.29
MEDIUM ADVERTISING	-0.036	5.84	$2.85	$1.26
HIGH ADVERTISING	-0.257	28.07	$20.22	$1.32
COST	-0.013	130.7		
CONSTANT	0.289	30.21		
λ	1.569	68.54		
Likelihood	-1.087			
Respondents	5,131			
Observations				

NOTES. MU is estimate of marginal utility. t is t ratio for MU estimate. WTP is estimate of willingness to pay. s.e. is standard error of WTP estimate. λ is the estimate of the ratio of the standard deviation of the errors in evaluating the status quo alternative to the errors in evaluating the hypothetical alternatives. Likelihood is mean log likelihood.

Table 20. Ordered Probit Estimates of Media Environment Features and Television Market Structure

	DIVERSITY OF OPINION	COMMUNITY NEWS	MULTI-CULTURALISM	ADVERTISING
TV STATIONS	-0.009	0.024*	-0.035***	-0.019
	(0.013)	(0.013)	(0.013)	(0.013)
TV VOICES	0.052***	0.009	0.081***	0.052***
	(0.018)	(0.018)	(0.018)	(0.018)
TV STATIONS × TV VOICES	-0.0007	0.001***	-0.0007	-0.0007
	(0.0005)	(0.0005)	(0.0005)	(0.0005)
AGE	0.053***	0.096***	0.031***	0.112***
	(0.010)	(0.010)	(0.010)	(0.010)
EDUC	0.123***	0.084***	0.125***	0.111***
	(0.018)	(0.018)	(0.017)	(0.018)
GENDER	-0.048	0.114***	0.024	0.023
	(0.032)	(0.032)	(0.032)	(0.032)
INCOME	0.056***	0.004	-0.031**	0.033**
	(0.014)	(0.014)	(0.014)	(0.014)
RACE	0.083**	-0.128***	-0.053	0.179***
	(0.036)	(0.036)	(0.036)	(0.036)
$\partial \boldsymbol{\beta}'\mathbf{x}/\partial$TV VOICES	0.043**	-0.010	0.071***	0.044**
	(0.016)	(0.016)	(0.016)	(0.016)
Likelihood	-4,822.7	-5,189.6	-5,186.2	-4,951.4
Observations	5,123	5,123	5,123	5,123
Markets	203	203	203	203

NOTES. The values for each dependent variable, DIVERSITY OF OPINION, COMMUNITY NEWS, MULTICULTURALISM and ADVERTISING are low, medium and high. $\partial \boldsymbol{\beta}'\mathbf{x}/\partial$VOICES is the effect of TV VOICES on the index function, $\boldsymbol{\beta}'\mathbf{x}$, where $\mathbf{x} = [1, X_j, Z_i]$, 1 is a vector of ones, and $\boldsymbol{\beta} = [\alpha, \delta, \gamma]$. Markets is the number of television markets. Coefficient estimates for the 15 media source combination dummy variables are not reported. Estimated by weighted maximum likelihood. Standard errors in parentheses. ***denotes significant at the one percent level. **denotes significant at the five percent level. *denotes significant at the ten percent level.

Table 21. Mean Change in Predicted Probabilities

	Diversity of Opinion	Multiculturalism	Advertising
ΔP_L	0.0106	0.0260	0.0089
ΔP_M	0.0028	-0.0081	0.0074
ΔP_H	-0.0134	-0.0179	-0.0163

NOTES. Sample means are calculated from each individual respondent's predicted probabilities.

Table 22. Changes in Consumer Welfare From a Merger between Two Television Stations

Market: Number of TV Stations	Pop. share (%)	Diversity of opinion	Multi-culturalism	Advertising	Total	Diversity of opinion	Multi-culturalism	Advertising	Total
		Average consumer welfare per month (dollars per month)				Annual aggregate consumer welfare in market (annual dollars in millions)			
5	5.0	-$0.34	-$0.12	$0.34	-$0.11	-$18.10	-$6.18	$18.31	-$5.98
6	6.1	-$0.33	-$0.11	$0.34	-$0.11	-$21.94	-$7.53	$22.14	-$7.33
7	9.1	-$0.33	-$0.11	$0.34	-$0.11	-$32.28	-$11.23	$33.05	-$10.46
8	8.1	-$0.32	-$0.11	$0.33	-$0.10	-$27.91	-$9.82	$29.24	-$8.48
9	9.5	-$0.31	-$0.11	$0.33	-$0.09	-$31.83	-$11.34	$33.72	-$9.45
10	5.6	-$0.30	-$0.11	$0.32	-$0.09	-$18.38	-$6.59	$19.55	-$5.42
11	9.9	-$0.30	-$0.11	$0.32	-$0.09	-$31.71	-$11.51	$33.80	-$9.42
12	6.9	-$0.30	-$0.11	$0.31	-$0.09	-$22.00	-$7.99	$23.02	-$6.98
13	2.4	-$0.28	-$0.10	$0.31	-$0.08	-$7.20	-$2.65	$7.85	-$1.99
14	9.3	-$0.27	-$0.10	$0.30	-$0.06	-$26.93	-$9.94	$30.47	-$6.40
15	3.0	-$0.27	-$0.10	$0.29	-$0.07	-$8.78	-$3.27	$9.63	-$2.42
16	7.9	-$0.25	-$0.10	$0.29	-$0.06	-$21.74	-$8.33	$25.12	-$4.95
17	7.2	-$0.25	-$0.10	$0.29	-$0.07	-$19.80	-$7.50	$22.24	-$5.06
18	4.3	-$0.25	-$0.10	$0.28	-$0.07	-$11.69	-$4.52	$12.97	-$3.23
19	2.6	-$0.24	-$0.10	$0.28	-$0.06	-$6.83	-$2.75	$7.98	-$1.60
20	3.2	-$0.23	-$0.09	$0.28	-$0.04	-$7.99	-$3.10	$9.71	-$1.39

NOTES. The merger is a one-unit reduction in the number of independent television voices in the market, all other things held constant. There are 90,193,905 population households in markets from five to 20 television stations (FCC, 2011). Pop. share is the number of population households in the market divided by population households. For example, Pop. share for the five-station market is 4,469,100/90,193,905 = 5.0 %. Pop. share for the 20-station market is 2,924,767/90,193,905 = 3.2 %.

Figure 1. Your Actual Media Environment Example

In summary, your answers indicate that you listen to the radio, watch television, and use the Internet to get information on news and current affairs. Your overall media environment also has the five features described in Table 1 below.

Table 1. Your actual media environment		
Click here to review a summary of the levels of all the features (Table 2). *To see the description of an individual feature, place your cursor over that feature*		
Feature	**Level**	**Description**
Diversity of opinion	Medium	Your media environment provides information on news and current affairs from a few different viewpoints.
Community news	Medium	Your media environment provides some information on community news and events.
Multiculturalism	Low	Your media environment provides very little or no information that reflects the interests of women and minorities.
Advertising	High	The amount of space and/or time devoted to advertising in your overall media environment is annoying.
Cost	$135 per month	The total of your monthly subscriptions to all of your media sources, plus any contributions to public radio or public TV stations.

Figure 2. Choice Scenario Example

1. Consider the following two media environment options, A and B, which provide news and current affairs from *your* media sources: radio, television, and the Internet. The two options differ by the levels of diversity of opinion, community news, multiculturalism, advertising, and by cost.

   For this first question, we highlight the differences in the levels of the five features in red. For some of these five features, there may be no difference. Check the media environment option you would prefer.

   Click here to review a summary of the levels of all the features.
   To see the description of an individual feature, place your cursor over that feature

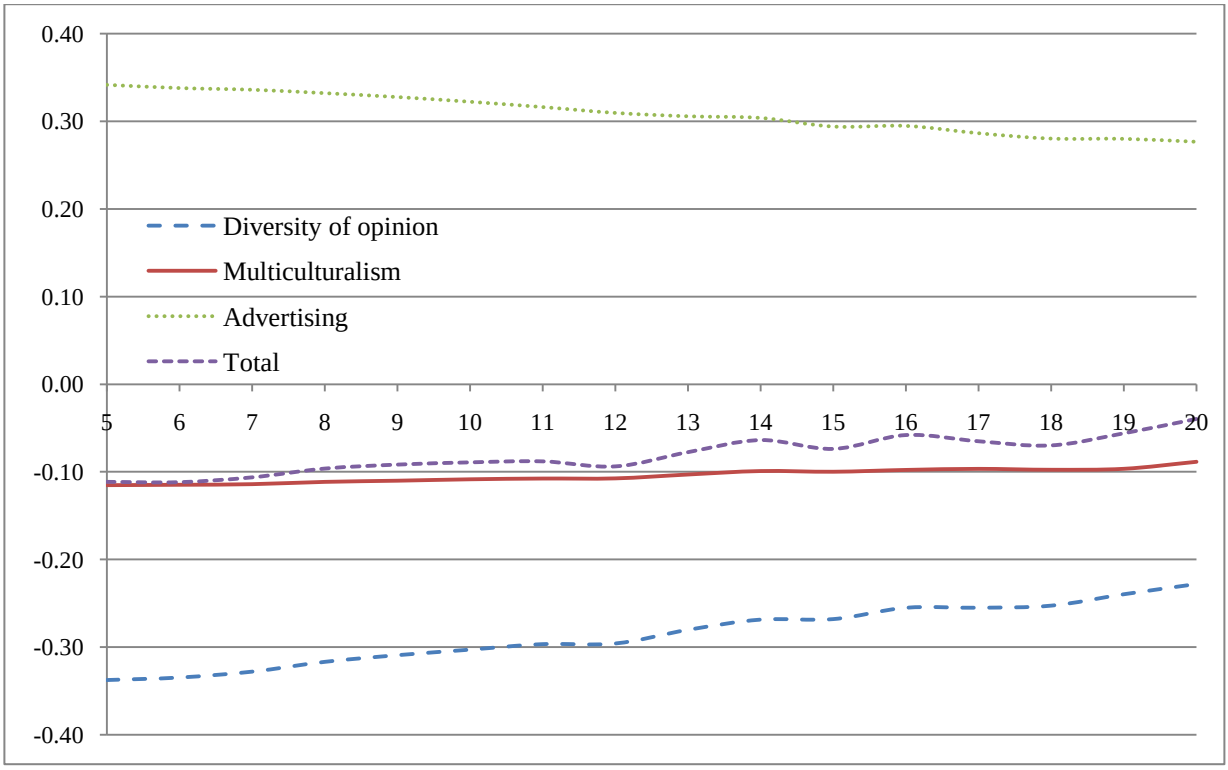
	Option A	**Option B**
Diversity of opinion	Low	Medium
Community news	Medium	Low
Multiculturalism	Low	Low
Advertising	High	Medium
Cost	$25 per month	$45 per month
	Option A is less expensive and has more information on community news and events	*Option B has less advertising and more diversity of opinion*
Select the option you prefer	○ I prefer option A	◉ I prefer option B

2. Since you currently have a media environment at home, we also ask if you would actually switch to the media environment, B, you have chosen. Consider the features of your actual media environment. Would you switch to the option B you chose previously?

   Click here to review a summary of the levels of all the features.
   To see the description of an individual feature, place your cursor over that feature.

	Your media environment	**Option B**
Diversity of opinion	Medium	Medium
Community news	Medium	Low
Multiculturalism	Low	Low
Advertising	High	Medium
Cost	$135 per month	$45 per month
Select the option you prefer	○ I prefer option A	◉ I prefer option B

Figure 3. Change in Average Consumer Welfare Per Month From a Merger between Two Television Stations



NOTES. Vertical axis is dollars per month and horizontal axis is number of television stations. The merger is a one-unit reduction in the number of independent television voices in the market, all other things held constant.

SOURCE. Table 22.