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Media, Instability, and Democracy: Examining the Granger-Causal Relationships of 122 Countries From 1946 to 2003

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Using cross-national time-series data in sequences of Granger causality tests, this study analyzed the democratic effects of media technologies with a sample of 122 countries. This process revealed that communication technologies are vital, but not exclusive or universal prerequisites of democratic growth. As expected by media system dependency (MSD) theory, media diffusion was shown to have Granger-caused democracy only in countries where media served more information functions or where sociopolitical instability levels were higher. Results further indicated that media diffusion is central to the development of sociopolitical instability, which suggests certain direct and indirect macrolevel democratic effects of mass media diffusion. The conditions of MSD theory observed here also demonstrated an integrative relationship with the economic development thesis.

Owing to the role of the public and the information delivery function of mass media in liberal democratic (van Dijk, 2006) and communication theories (Ball-Rokeach & DeFleur, 1976), communication technologies have been considered important to democracy both historically and contemporarily (Lipset, 1959, 1994; Vanhanen, 1992). For example, Mill (1859) long ago made the point that the exchange of ideas in a public forum was not only good, but also essential for societies—especially democratic ones—and these same sentiments have been since reinforced by the more recent work of Habermas (1989) concerning more modern media systems, public spheres, and democracies.

Many scholars have continued to evaluate the diffusion of modern media systems, their content, and their democratic utility in research inquiries (Lerner, 1958; Rogers, 2003). Therefore, this study empirically examined the fundamental proposition that the diffusion of certain media technologies—specifically newspapers, radios, and

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televisions—have contributed to democratic growth (Buchner, 1988; Denny, 1941; Winham, 1970). This process involved comparing the democratic effects that these three traditional media have shown over the course of approximately 50 years and using that precedent to make circumspect predictions about the democratic effects that new media may show when following a similar global diffusion pattern.

Specifically, this study included 122 countries from 1946 onwards to 2003 and employed macrolevel, cross-national data that included time-ordered measures of democracy, media, social instability, income, urbanization, and population. Countries were grouped by theoretically informed characteristics and sequences of Granger causality tests were then conducted using multivariate vector autoregressive (VAR) models. In the formulation innovated by Granger (1969), these tests were modeled to determine whether lagged information on the variable Y provides any statistically significant information about the variable X in the presence of lagged X values (Sims, 1972). For the purposes of this study, Granger causality tests determine if media diffusion preceded democratic growth over time to the extent that media diffusion contributed statistically to an increase in democracy.

As far back as Frey's (1973) review of the field, many previous studies in the area of communication and development have suggested that an increase in mediated information networks may have meaningful effects on the resultant public sphere and democratic growth (Best & Wade, 2005; Groshek, 2009; Kedzie, 2002; Pilat & Wyckoff, 2005; Weaver, 1977; Weaver, Buddenbaum, & Fair, 1985). Democratic development, however, has itself been best understood as only one interdependent component of social, economic, and cultural considerations (Frey, 1973; Derviş, 2006). In their seminal book on the topic, Lerner and Schramm reported that development communication "tends to be discussed in terms of a total program of social change" (1976, p. 343) and this multimodal communication framework remains vitally relevant to understanding contemporary global governance (Castells, 2008).

Even when taking into account the substantial theoretical and practical advances in this arena, the directional relationship between media diffusion and democratization is still fraught with uncertainty. Principally, this ambivalence results from the justifiable conception of increased media diffusion, especially of independent and pluralistic media systems, as an indicator of democracy rather than a causal mechanism. In other words, it remains undetermined if media diffusion is a basis for or a product of democratic augmentation. The study reported here begins to fill this gap by exploring the macrolinkages in media system dependency (MSD) theory and thereby re-examining the frequently cited and long-standing proposition that mass media contribute to the development of democratic growth in the form of institutionalized national-level processes, practices, and rights (Dennis & Snyder, 1998; USAID, 1999).

Theory and literature review
Research on traditional media has suggested that "mass communication development may indeed play an important role in the growth of participant forms of government

in many areas of the world'' (Weaver, 1977, p. 168) and it is widely accepted as conventional wisdom that mass media are important to initiate and maintain national democracies (Bennett, 1998). Indeed, a large portion of communication research hinges on the belief that media serve an important democratic function in both developed and developing countries. Without disputing the veracity of this position, it is worthwhile, however, to consider that the fundamental presumption of communication technologies as *prerequisites* for greater democracy levels has not been subjected to much empirical scrutiny in communication research.

Moreover, there is a vast amount of research on democratization that proceeds with media development as a relatively minor component of a transitional process (Burkhart & Lewis-Beck, 1994; Helliwell, 1994; Huntington, 1984, 1991). Most notably, the economic development thesis has consistently demonstrated that ''democracy is related to the state of economic development'' (Lipset, 1959, p. 75). Explanations of this economic-political tension often include spreading control and expectations of government across a variety of people (Dahl, 1989) and in many instances this dispersion occurs through mass media outlets. Similarly, a considerable amount of scholarly attention has been paid to the interdependent relationship between sociopolitical instability and economic growth (Alesina, Ozler, Roubini, & Swagel, 1992; Barro, 1991) as well as the impact of instability on social capital and democracy (Haque, Santhirasegaram, & Younis, 2007; Persson & Tabellini, 2006a).

Consequently, MSD theory is often overlooked but does provide a useful framework for mapping changes between macrolevel social structures such as those between communication technologies, instability, economics, and democracy (DeFleur & Ball-Rokeach, 1989). Within the immediate scope of this inquiry, there are two primary conditions that warrant consideration in this theory: (a) the number and centrality of information functions that certain media serve in a society and (b) the level of sociopolitical instability and change in a social system. According to these propositions laid out in MSD theory, there is an increased likelihood of media dependency and observable individual and societal effects as a result of that dependency when mass media serve a greater number of pertinent information functions or when there are greater levels of social conflict and change. In addition, the macrolevel relationships described in MSD theory are well suited to analyses of this kind because large social changes are theoretically supported and integrated with individual, microlevel effects (Rubin & Windahl, 1986). Indeed, one of the central defining features of this theory contends that mass media are ''information systems vitally involved in maintenance, change, and conflict processes at the societal as well as the group and individual levels of social action'' (Ball-Rokeach & DeFleur, 1976, p. 5). MSD theory thereby also identifies the relationships and conditions through which feedback from individual and organizational levels may precipitate macrolevel change by incorporating effects that cross social levels from the individual to the institutional (DeFleur & Ball-Rokeach, 1989).

As the results of those social changes may be manifest in relationships that range from micro through macro on several societal levels, MSD theory negotiates the

assumptions of resonance and redundancy that von Bertalanffy (1968) recognized as crucial to durable structural social changes. As a general system theory, MSD explicates the dependency relationships and mutual influence (Ball-Rokeach & DeFleur, 1976) of macrolevel structures in a society—in this case specifically media diffusion, instability, and democratic growth. Crucially, however, nowhere in media diffusion measures is the content of media messages explicitly considered. Media ownership can of course also act as an intervening variable in this process by consolidating or tightening the flow of unique content (Boczkowski & de Santos, 2007; Frey, 1973). Despite these content-based limitations, the ''general availability of such information'' (Weaver et al., 1985, p. 110) has been used previously to estimate effects on freedoms of expression and the accountability of governors.

For this study, it is critical to point out that diffusion measures do not *prove* but rather approximate the centrality and number of information functions that certain media serve in a society. The diffusion of the media technologies is regularly coincidental with the actual growth of the channels and content available through mass media (Compaine, 2005; Sterne, 1999), which addresses in aggregate form both the number and centrality of information functions identified as crucial to increasing dependency and the likelihood for demonstrable media effects (Ball-Rokeach & DeFleur, 1976). In other words, higher levels of media technology diffusion are generally indicative of more media channels and outlets (Norris, 2000) with a potentially wider array of content (Bimber, 1998; Markus, 1987). It is therefore possible to observe the macrolevel interrelationships between democracy, media, and sociopolitical instability over time.

Previous research by Weaver (1977) and Weaver et al. (1985) identified several informative models that take into account media diffusion and sociopolitical instability in relation to democracy and other societal factors. Although these cross-national models diverge somewhat based on national development statuses, they account for the macrolevel variables outlined in MSD theory by Rubin and Windahl (1986). The work of Weaver and colleagues (1985) largely positions democracy, or accountability of governors, as a reciprocally dependent outcome of media development. It also incorporates income, education, and urbanism as other macro and social factors found in MSD theory that contribute to democracy, communication technologies, and the variation in extant structural instability.

In MSD theory, the more pronounced social structural dependencies are, the greater the likelihood of influence. This theory thus explicates instances when media diffusion patterns over time are more likely to engender democratic growth in a given country as well as instances of noneffects. Specifically, greater democratic effects of mass media can be expected in nations where media are more prevalent and thus fill more central information functions or in nations that experience a high degree of sociopolitical instability through conflict and change. To that point, O'Loughlin et al. (1998, p. 552) wrote, ''The quality and cost of particular communication channels, as well as the activities of promoters and opponents, affect the extent to which political information is shared and ultimately influence whether democracy

is implemented.'' Given this framework, it is imperative to examine macrolevel relationships because communication systems are often considered social requisites of democracy (Lipset, 1994; O'Loughlin et al., 1998) and limited or inaccessible media networks are conversely understood as constraints on democratic development (Nef & Reiter, 2009; Vanhanen, 1992).

Indeed, the two-way structurally dependent relationship between media systems and political systems outlined in MSD theory indicates that ''the political system endorses the media system by granting it constitutional and other legal rights to operate as an information system'' (DeFleur & Ball-Rokeach, 1989, p. 305). It therefore follows that in autocratic societies where civil liberties, such as the freedom of the press and other forms of free expression, are curtailed through political regulation are countries less likely to demonstrate political change (Ali, 2005). Limited guarantees of civil liberties can therefore also be positioned as a constraint on not only the level of media development but also the potential for demonstrable effects in relation to media diffusion and use. Reciprocally, more democratic societies with greater guarantees of civil liberties are theoretically more likely to demonstrate political change as a result of media development because of greater information flows and more vital, accessible discursive public spheres that are engendered by functional democracies.

Gauging the influence of such social factors on democracy can be problematic for reasons of statistical and conceptual endogeneity as well as the bounded nature of many national-level democracy scales. In this study, 16 countries maintained the maximum democracy value for all years under analysis and another country had no variance but at a lower democracy level. It is also worth pointing out that 20 countries achieved the fully democracy status for at least 1 year during the course of this study, and 13 of those maintained that level through 2003. Figure 1 graphically summarizes the mean level of democracy rankings over time in relation to the mean distributions of newspapers, radios, televisions, and sociopolitical instability for the 122 countries included in this study.

Although measuring national-level democracy can be instrumentally imprecise by restricting variance with upper and lower boundaries, it remains clear that many less democratic or autocratic countries attempt to benefit economically from communication technologies (Persson & Tabellini, 2006b). Furthermore, many such nations simultaneously attempt to mitigate the possibility for latent democratic effects or sociopolitical instability by controlling the information flow and repressing forms of free expression and civil liberties in the ''dictator's dilemma'' (Kedzie, 2002). Since Ball-Rokeach and DeFleur (1976) asserted that media dependency is heightened ''when a relatively high degree of change *and* conflict is present in a society'' (p. 7, emphasis in original), it is also imperative to examine the extent to which media technologies are related to both sociopolitical instability and national-level democracy.

One of the most compelling reasons that sociopolitical and media conditions seem so potent in influencing the media-democracy relationship is that they mutually
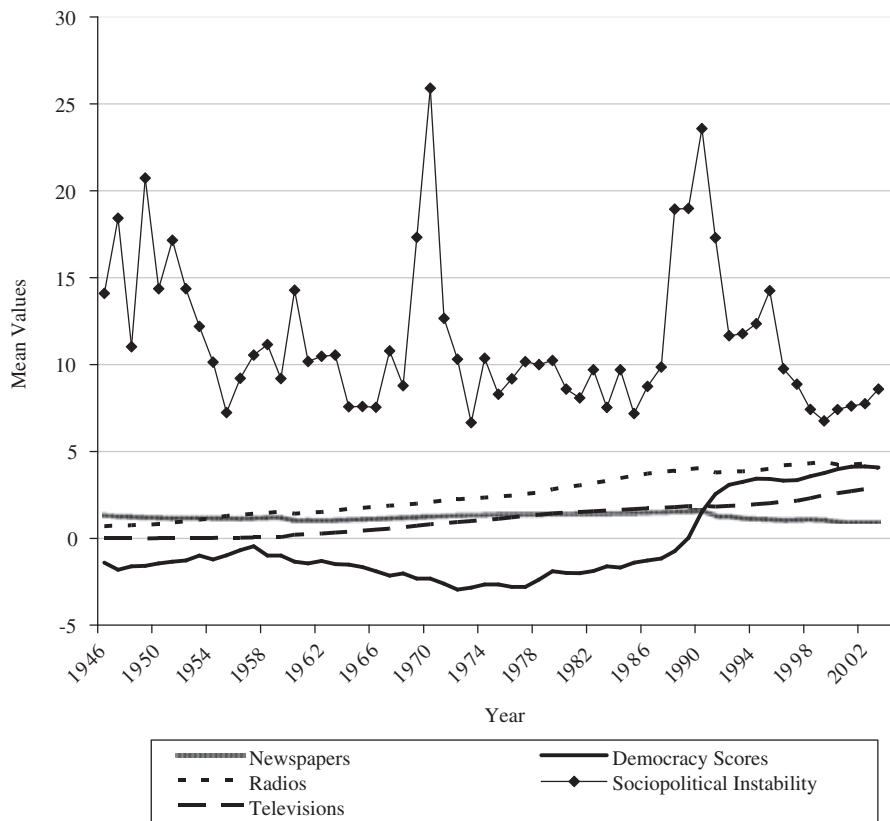
Figure 1 Linear relationships between mean levels of national democracy, traditional media development, and sociopolitical instability for all countries from 1946 to 2003.

Note: Media development figures are scaled in terms of televisions, radios, and newspaper circulation per 100 people. Sociopolitical instability is also scaled by a factor of 100 for comparability.

reinforce one another on a *national and social* level in much the same way Norris (2000) described the "virtuous circle" on an individual level. That is, more robust media systems often enhance engagement and mobilization in citizen politics (Ayres, 1999; Bucy & Gregson, 2001). As Feng (1997) demonstrated, this activation can take on different forms of sociopolitical instability and responses depending on the prevailing level of democracy (or autocracy) within a given nation. Still, in various manifestations, this motivation and public scrutiny may act as a stressor on domestic politics (Bimber, 1998), which can potentially either constrain political decision-making or reshape the political landscape into a more democratic one (Burstein, 2003).

Considering this body of theoretical and empirical work, there is reason to believe that the two principal propositions advanced by MSD theory will hold in time-series

analysis. To specifically analyze these assertions, countries were categorized by characteristics of media development and sociopolitical instability in advancing the following hypotheses:

H1: In countries where media serve more information functions, media diffusion will Granger-cause institutionalized democratic growth.

H2: In countries with greater sociopolitical instability due to conflict and change, media diffusion will Granger-cause institutionalized democratic growth.

Methods

The key concept under investigation here was the prevalence of communication technologies in a given country and how these media related to democratic growth over the time period of 1946 to 2003. The unit of analysis for data collection was the nation, and data were collected yearly by organizations such as Banks' Cross-Polity Time-Series Database, the Center for Systemic Peace, the International Telecommunications Union, the United Nations, and the World Bank. Although there remains some skepticism about national-level measures, van Dijk (2005) reported that such organizations "are supplying sufficiently reliable data about countries worldwide" (p. 46) upon which longitudinal trends can be derived.

To explicitly test the theoretical proposition advanced by MSD theory regarding the relationship between democratic growth and traditional media development in H1, all countries were divided into two categories ("high" and "low") based on their average level of overall media diffusion over time. The average media diffusion for all countries across all years was a mean of 17.16 ($SD = 14.96$) newspapers, radios, and televisions per 100 citizens. This figure was therefore used as the demarcation point for groups of countries.[1] Similarly, countries were also divided into groups of "high" and "low" average sociopolitical instability levels to examine if, as proposed by MSD theory and H2, increased conflict and change in a social system engendered more evident media effects. As the mean level of sociopolitical instability was 1125.34 units on the Banks' weighted conflict index for all countries over all years ($SD = 891.49$), this figure was used to divide countries into high and low sociopolitical instability groupings.

Timeframe and country selection

The nature of any time-series model is predicated upon a minimum of 40 data points (Poole, McPhee, & Canary, 2002). The timeframe of this study comprised a maximum of 58 years (data points) from 1946 to 2003. Following a categorization system described by Groshek (2010), countries must have maintained generally consistent borders as a self-ruling political entity or separated from established "parent" countries for no less than 40 cumulative years. Countries were excluded if data were missing for more than 15% of any variable series or country.

Procedures of Granger causality tests

Granger causality tests mathematically calculate whether the lags of one variable (such as media diffusion) enter into the equation for another variable (such as democracy) and refer only to the effects of past values in variable dyads (Enders, 2004). In other words, Granger causality tests statistically measure ''that if X Granger-causes Y, then X is a useful predictor of Y, given the other terms in the regression'' (Stock & Watson, 2003, p. 449). In the sense of Humean causation, it is clear that Granger causality testing does not intrinsically meet all four of the conditions for causality identified by Cook and Campbell (1979). As described by McLeod and Tichenor (2003, p. 101) these conditions are: (a) whether cause and effect covary, (b) whether the cause precedes the effect, (c) whether the cause and effect do not appear independent of one another, and (d) all potentially confounding third variables are controlled.

Granger causality testing statistically satisfies Condition 1 of association and Condition 2 of time ordering. In this study, Condition 3 of independence (specifically that effect ''Y'' of democratic growth does not appear in the absence of or without cause ''X'' of traditional media) is managed through conducting reciprocal Granger causality tests with nations of differing levels of media diffusion and sociopolitical instability statuses. Specifically, this includes systematically setting all endogenous variables as dependent and, for each equation in the VAR, jointly testing the hypotheses that each of the other endogenous variables does not Granger-cause the dependent variable in that equation. In so doing, potential reciprocity and null events can be observed. Although the models are fairly robust with socioeconomic variables, they cannot explicitly satisfy Condition 4 that all other potentially confounding third variables are controlled.

Of course, there is also a distinction between a necessary causal condition and a sufficient causal condition. Since democracy itself existed in certain states long before many forms of media systems were developed, the Granger causality tests conducted here are concerned with whether or not different forms of media constitute a sufficient condition ''whose presence always implies that the event will occur'' (McLeod & Tichenor, 2003, p. 102). Likewise, Mill (as cited in Mackie, 1967) argued for the condition of identifying a specific active causal mechanism, which in this study would be the content of the media technologies analyzed here. Altogether, these causal theorists have outlined criteria by which causality can be discerned, and the statistical routines carried out here reasonably fulfill these requirements given that the diversity of media content is only approximated by media diffusion rates.

As such, should the Chi-square statistic of Wald tests examining the null hypothesis demonstrate that a series of lags are statistically significant, then media diffusion could be said to have ''Granger-caused'' increases in the level of democracy. This does not mean that a change in media growth necessarily *caused* a subsequent change in democracy, but it would indicate that the past values of traditional media diffusion contained information that preceded and were related to changes in the level of democracy, and added a predictive capacity beyond that of the past values of democracy measures alone (Stock & Watson, 2003). Thus, these Granger causality

tests measure the relationship between media diffusion and democracy as well as other factors of sociopolitical instability, income, urbanism, and population with a 2-year time lag.

Although lag lengths can be controversial, Liew (2004) found that Akaike's information criterion (AIC) was superior in identifying lag orders when examining samples of 60 or less observations, as was the case with this sample. For each of the four groups of countries in this study (high media, low media, high instability, low instability), a lag period of 2 years produced the lowest AIC values, which indicated that other lag lengths did not increase explanatory power. In choosing this lag, there was no empirical or theoretical reason to expect or control for seasonality in any of the democracy or national development series since all distributions are based on yearly data. Another important assumption for internal validity and consistency of Granger causality tests is that data must be stationary (i.e., statistical properties such as mean and variance are constant over time). Dickey-Fuller tests were completed for all of the variables in each VAR model to test for unit roots, which resulted in uniformly transforming several variables to achieve stationarity.[2]

Altogether, these procedures of Granger causality testing were conducted in order to provide specific evidence if (as well as where and under which conditions) an increase in media has Granger-caused democratic growth. As this methodological approach is fairly exploratory in communication research, a generous $p \leq .10$ cutoff was used in reporting all results.

Variable identifications

Data were input for each of the following variables identified by Weaver et al. (1985) in their model of democratic development: democracy, media, sociopolitical instability, income, urbanism, and population. Although education enrollment figures have been significant correlates of media development in previous studies (Groshek, 2009; Weaver, 1977; Weaver et al., 1985), data from any source were simply not complete enough to be considered and modeled here.

Democracy

The "Polity 2" score is a multicomponent historically informed measure of fair political competitiveness, formalized constrains on the abuse of power, and citizens' ability to freely exercise civil liberties that is drawn from the Polity IV database to model national-level democracy. These scores range from −10 to +10 and have been applied in similar cross-national analyses (see Groshek, 2010; Gurr & Associates, 1978).

Mass media diffusion

All media figures are at least partly based on the same primary source, the UN Statistical Yearbook, which allows for an inclusive combination of data collected by different agencies. Newspaper circulation figures per thousand were gathered from the Banks' Cross-Polity Time-Series Database through 1999. The remaining

years were supplemented with figures from the World Bank Database of World Development Indicators. Similarly, the number of radios and televisions per thousand also originated with Banks' data. Both radio and television figures were combined as necessary with figures from the International Telecommunications Union for the years 2000 to 2003. Remaining gaps were filled by the mean of appropriate figures for the years immediately before and after.

Sociopolitical instability

This variable was derived from the weighted conflict index presented in the Banks' Cross-Polity Time-Series Database for all years without combination with any other data streams. This data represented an index of domestic stress and was used to approximate sociopolitical instability by including weighted codings of the assassinations, general strikes, guerrilla warfare, government crises, purges, riots, revolutions, and antigovernment demonstrations that took place in each country each year. Mean substitution at the country level was used to replace missing data.

Income

This study employed GDP per capita figures in U.S. dollars from Banks' Cross-Polity Time-Series Database through 2000. Gross national income (GNI) per capita figures, also based on U.S. dollars and compiled by the World Bank Database of World Development Indicators, were supplemented for 2001 to 2003. Since GNI is a similar but updated version of GNP that has become the standard for measuring countries' relative wealth, these figures were highly comparable. Any missing data points were substituted at the country level with the mean of figures for the years immediately before and after the gap.

Urbanism

Telephone per capita data was summed with population density figures in a simple additive index. Banks' Cross-Polity Time-Series Database provided fixed-line telephone figures from 1946 to 1993, and, starting with 1994, mobile and fixed telephone data from the International Telecommunications Union were integrated. Population density figures were all derived from Banks' Cross-Polity Time-Series Database. Missing data were substituted by mean imputation of relevant cases by country before and after the interruption.

Population

Population figures were gathered from the Banks' Cross-Polity Time-Series Database and are modeled to control for variances across nations and over time.

Findings

Hypothesis 1 was concerned with the number and centrality of information functions media serve. The first group of countries comprised 45 "high" media nations

that had an average number of traditional media technologies greater than of 17.16 per 100 citizens. Based on the expectations of MSD theory outlined in H1, it should be more likely that increased media diffusion Granger-caused greater institutionalized democratic growth within this group of countries. Results largely support this hypothesis. Both radio ($\chi^2 = 9.3$, $p \le .01$) and television ($\chi^2 = 9.1$, $p \le .01$) diffusion rates were observed to have Granger-caused democracy among this group of "high" media countries. Although newspaper diffusion was not observed to have Granger-caused democratic growth in these countries, income ($\chi^2 = 7.0$, $p < .05$) and sociopolitical instability ($\chi^2 = 11.9$, $p < .01$) measures were.

In addition to these findings, the diffusion of newspapers ($\chi^2 = 9.3$, $p \le .01$), radios ($\chi^2 = 16.0$, $p < .01$), and televisions ($\chi^2 = 9.5$, $p < .01$) were all shown to have Granger-caused sociopolitical instability among countries with a high level of media diffusion. Since sociopolitical instability Granger-caused democracy, these media technologies can be considered to have also had indirect effects on democratic development in the subsample of countries examined here. It is also worth reporting that democracy Granger-caused the diffusion of newspapers ($\chi^2 = 36.5$, $p < .001$), radios ($\chi^2 = 4.8$, $p < .10$), and televisions ($\chi^2 = 20.5$, $p < .001$). These results, along with other significant Granger-causal predictors are summarized in Table 1.

A second component of H1 implicitly predicted the null hypothesis that media diffusion would not Granger-cause institutionalized democratic growth in countries where media are less central and serve fewer information functions. In the sample of 77 "low" media countries examined here, none of the three media technologies were observed to have Granger-caused democracy. This hypothesis was therefore fully supported, which provides more empirical evidence to the first macrolevel proposition of MSD theory. Simply stated, the results of testing H1 identified that media were significantly more likely to contribute to democratic growth in countries where media systems were more prevalent and thus served a greater number of central information functions.

Interestingly, none of the variables considered in the low-media VAR model Granger-caused democracy. This finding suggests a considerable difference in the democratic statuses of these countries that extends beyond just media development. A statistically significant t test, $t(6541) = 23.57$, $p < .001$, detailed the discrepancy in the average democracy levels of high-media countries (2.25) and low-media countries (-2.04). Nonetheless, it is worth pointing out that even in countries with a low level of media diffusion that were generally more autocratic, increased levels of democracy were shown to have Granger-caused increases in newspapers ($\chi^2 = 17.2$, $p < .001$), radios ($\chi^2 = 10.0$, $p < .01$), and televisions ($\chi^2 = 32.8$, $p < .001$). All significant Granger-causal relationships for this group of countries are also summarized in Table 1.

The second hypothesis examined the impact that sociopolitical instability had on the democratic effects of media diffusion over time. There were 48 countries with a "high" level of sociopolitical instability greater than the average figure of

Table 1 Significant Granger-Causal Relationships in Countries Differentiated by Media Centrality and Sociopolitical Instability Levels

Granger Relationship	High Media	Low Media	High Instability	Low Instability
Newspaper → Democracy	—	—	4.7#	—
Radio → Democracy	9.3**	—	10.4**	—
Television → Democracy	9.1**	—	8.7*	—
Instability → Democracy	11.9**	—	—	10.2**
Income → Democracy	7.0*	—	6.0*	—
Urbanism → Democracy	—	—	4.6#	—
Newspaper → Instability	9.3**	—	—	6.3*
Radio → Instability	16.0***	4.8#	11.5**	8.3*
Television → Instability	9.5**	—	—	17.6***
Income → Instability	11.8**	—	—	9.4**
Democracy → Newspaper	36.5***	17.2***	—	14.1***
Radio → Newspaper	—	—	—	—
Television → Newspaper	—	21.0***	—	—
Instability → Newspaper	—	6.1*	—	—
Income → Newspaper	6.6*	—	—	—
Urbanism → Newspaper	—	15.7***	—	—
Democracy → Radio	4.8#	10.0**	—	—
Newspaper → Radio	—	10.4**	—	—
Television → Radio	—	20.2***	—	—
Income → Radio	5.6#	—	7.8*	—
Instability → Radio	—	6.0*	—	—
Urbanism → Radio	7.2*	9.2**	5.7#	—
Democracy → Television	20.5***	32.8***	15.1***	—
Newspaper → Television	19.7***	—	5.6#	—
Radio → Television	78.6***	15.3***	53.1***	6.1*
Instability → Television	—	—	—	10.3**
Urbanism → Television	—	—	10.3**	—
Democracy → Income	6.9*	—	—	—
Newspaper → Income	—	—	—	7.6*
Urbanism → Income	9.9**	—	—	9.2**
Democracy → Urbanism	—	12.1**	—	—
Newspaper → Urbanism	29.8***	—	—	7.6*
Radio → Urbanism	7.0*	16.1***	—	—
Television → Urbanism	—	53.5***	5.3#	6.1*
Instability → Urbanism	—	—	5.2#	—
Income → Urbanism	5.8#	—	—	—

$^{#}p \leq .10.$ $^{*}p \leq .05.$ $^{**}p \leq .01.$ $^{***}p \leq .001.$

1125.34 units on the Banks' weighted conflict index. It is useful to note that only 10 (20.8%) of these countries were also countries with a high level of media diffusion, thus demonstrating that this sample of high-instability countries does not confound testing H1 and H2. When analyzing the democratic effects of media in countries with a high degree of conflict and change, all three forms of media diffusion included here were shown to have Granger-caused democracy. This was the only cluster of countries to indicate such a relationship for newspapers ($\chi^2 = 4.7$, $p \leq .10$) as well as radio ($\chi^2 = 10.4$, $p < .01$) and television ($\chi^2 = 8.7$, $p \leq .01$). These results clearly support H2, which predicted that media diffusion would Granger-cause institutionalized democratic growth in countries with greater sociopolitical instability. Income ($\chi^2 = 6.0$, $p \leq .05$) and urbanism ($\chi^2 = 4.6$, $p \leq .10$) were the other variables that Granger-caused democratic growth among this group of countries.

As was the case with high- and low-media countries, radio diffusion was observed to have Granger-caused sociopolitical instability ($\chi^2 = 11.5, p < .01$), but in this case it was the only statistically significant predictor. Democracy reciprocally Granger-caused television diffusion ($\chi^2 = 15.1$, $p \leq .001$) but neither of the other media technologies. Although none of the other variables in this VAR were significant in explaining income, it is worthwhile to note that income only Granger-caused democracy in the high-media and high-instability groups, which relates interestingly to the general economic development thesis. Table 1 highlights these findings along with the remainder of significant Granger-causal relationships for these high-instability countries.

The second hypothesis also implicitly predicted the null that in countries with "low" levels of sociopolitical instability, media diffusion would not Granger-cause institutionalized democratic growth. Here, 74 countries were determined to have a low level of sociopolitical instability less than the average Banks' weighted conflict figure. This sample of countries remained unique from the low-media countries already analyzed, with which there was the highest overlap of 39 (52.7%) countries. More notably, support for this hypothesis was robust as newspapers, radios, and televisions were not shown to have Granger-caused democracy in this group of nations. In fact, only sociopolitical instability ($\chi^2 = 10.2$, $p < .01$) demonstrated a diffusion pattern in these countries that Granger-caused democracy, as summarized in Table 1.

Taken together with the previous of testing this hypothesis, it is clear that the second macrolevel proposition of MSD theory also holds under empirical examination. All forms of traditional mass media modeled in this study did precede an increase in institutionalized, national-level democracy in countries where there was more sociopolitical instability, yet since no media technologies demonstrated any such effects in low-instability countries, these findings seem related to greater media dependence as the result of a higher degree of conflict and change. Also, a statistically significant t test, $t(6541) = 5.83$, $p < .001$, provided evidence of the disparity in the average democracy level between countries that from the high (0.27) and low (-0.82)

categories of sociopolitically instability. Although these figures are not as striking as the differences between the average democracy scores of high- and low-media countries, it appears clear that autocracy itself acts as a constraint on sociopolitical instability, which has been shown in this study to diminish the likelihood that mass media could precipitate democratic growth.[3]

Despite this limitation, higher levels of sociopolitical instability were actually Granger-caused in the sample of low-instability countries by all three forms of media technologies. Indeed, newspaper circulation ($\chi^2 = 6.3$, $p < .05$), number of radios ($\chi^2 = 8.3$, $p < .05$), and televisions ($\chi^2 = 17.6$, $p < .001$) were all shown, along with income ($\chi^2 = 9.4$, $p < .01$) to have had an indirect relationship with democratic development through increased sociopolitical instability in this group of countries. Here, democracy was also shown to have reciprocally Granger-caused newspapers ($\chi^2 = 14.1$, $p < .001$) but no other variables for this country group.

Altogether, these findings clearly supported the two key macrolevel propositions advanced in media systems dependency theory. The results of this study also indicated an important gap in previous theoretical models and empirical findings: Media diffusion is crucial to the development of sociopolitical instability. Although not uniform across the groups of countries as analyzed here, at least one form of mass media was shown to have Granger-caused sociopolitical instability in each of the four country groups. These findings, especially as the result of time-series analyses, invigorate the long-standing assumption that mass media are crucial requisites of democratic development. It is vital to consider, however, that this evidence suggests media diffusion takes on additional roles in these processes—namely by cultivating sociopolitical instability.

As shown in this study, sociopolitical instability increased the likelihood that mass media may contribute directly to democratic development through increased dependency. But in building this theory further, it must be noted that mass media diffusion also contributed to increasing levels of sociopolitical instability and media are thereby used to carry out more than one role in the process of democratic augmentation. The relationships between sociopolitical instability and mass media thus ought to be considered more fully, especially when noting that both high media diffusion and high sociopolitical instability are also conditions in which economic growth was observed to have had a direct Granger-causal effect upon democracy.

Conclusions

This study empirically examined whether traditional forms of mass media have contributed to the development of institutionalized democracy, which is an assertion that can be traced back to the Gutenberg printing press (Grabe & Bucy, 2008). Although this study does have clear limitations—not all measures of national characteristics could be included and neither media content nor media ownership

were expressly examined or controlled—the results of hypotheses testing found generous support for MSD theory. The empirical analyses identified certain conditions where an increase in media diffusion did precede and help explain democratic growth from 1946 to 2003. As theorized, mass media diffusion was shown to have had democratic effects in countries where media served more central information functions and where sociopolitical instability levels were generally higher. The conditionality of these findings is also similar to that of Dahlgren (1995) and Norris (2000, 2001), who noted that not all individuals, let alone societies, use media for the same democratic or civil society purposes.

Higher levels of media diffusion and sociopolitical instability each clearly appeared to increase the likelihood that media augmented democracy, which aligns with the findings of Banks (1972), Groshek (2009), Weaver (1977), and Weaver et al. (1985). As these outcomes followed previous empirical patterns, they also demonstrate support for both key macrolevel theoretical premises of MSD theory (Ball-Rokeach & DeFleur, 1976). In countries where the conditions that increase media dependence were met, this study chronologically observed that media diffusion precedes, rather than follows, democratic growth. It is difficult, however, to neatly separate democracy from media because of the reciprocal effects seen here, in which increased democracy levels predicted growth in certain forms of mass media. In addition, these results suggested that media diffusion may have both direct and indirect macrolevel effects on democratic growth.

The instances for media to have had indirect democratic effects by predicting sociopolitical instability, however, were limited in this study to the two groups of countries—high media and low sociopolitical instability—where increased sociopolitical instability Granger-caused democracy. Increases in the diffusion of newspapers and televisions in these two country groups were shown to have Granger-caused sociopolitical instability and the diffusion of radios, which were the most prevalent media technology in this sample, Granger-caused sociopolitical instability in all four country groups. Considering the theoretical propositions of MSD theory, this finding positions media diffusion as having not only the potential for direct democratic effects in conditions that increase media dependence but also indirect democratic effects in enhancing the likelihood for such media dependence by contributing to sociopolitical instability.

One potential explanation for these observations is that increased media access may have activated citizens to apply pressure on their governments through a variety of means that were manifested here as elements of sociopolitical instability. Altogether, it is worthwhile to consider these results as creating conceptual space for a possible addendum to the already supported macrolevel propositions of MSD theory. Namely, more prevalent media systems might not only contribute to democracy under the conditions outlined in MSD, they seem to also potentially influence the structural level of sociopolitical instability that Ball-Rokeach and DeFleur (1976) and Rubin and Windahl (1986) identified as having audience effects. Such a restructuring of theoretical expectations would take into account the dualistic role in democratic

growth that media appeared to fulfill in this study through sociopolitical instability. It would also add to cross-disciplinary research that often considers the interdependent roles of economics, democracy, and sociopolitical instability (Bollen & Jackman, 1989; Feng, 1997).

Over the years, citizens and democratic political processes have been influenced by mass media in many ways and each media technology has imparted some residual democratic impact. Several examples of these technological democratic fingerprints from an American perspective include print accounts of the Lincoln-Douglas debates (Postman, 1985), the fireside radio chats of Franklin Roosevelt (Ryfe, 1999), the televised Kennedy-Nixon debates (Bimber & Davis, 2003; Grabe & Bucy, 2008), and media coverage of the civil rights movement (Santoro, 2008). In many countries, however, traditional media have become consumer commodities in a fragmented, international marketplace with content that has relatively little to do with civil society or national communities (Demers, 1999), which diminishes the likelihood that media diffusion might contribute to the augmentation of democracy (Loveless, 2009).

Without explicitly considering media content in this study, traditional media diffusion provided an historical basis upon which to extrapolate the democratic effects of new media technologies such as the Internet and its related applications as they follow a similar pattern of diffusion around the world. The processes of diffusion, integration, and activation are themselves dependent upon a variety of factors from cultural to technological and economic to legal (Hargittai, 1999; Milner, 2006; Sterne, 1999), so there is good reason for circumspection in making generalizations. Of course, there are also methodological limitations to this study, most notably that Granger causality tests can only statistically determine causality as a function of time-ordered events.

Even when taking these factors into account, traditional media technologies that are generally considered less participatory than forms of new media (Bucy & Gregson, 2001) were shown in this study to have Granger-caused democracy in countries where conditions of media centrality and sociopolitical instability were high. Based on this precedent and previous research (Best & Wade, 2005; Groshek, 2009), it is rational to expect the diffusion of the Internet (or other new media) to demonstrate a similarly positive relationship with democracy on an institutionalized national level. Yet due to the paradoxical roles that communication technologies often take on in the democratization process (Sun & Barnett, 1994), it remains to be seen if new media technologies will be related to increases in democracy and sociopolitical instability as traditional media were in this study. Although it is possible that new media might alter information flows and reshape democratization processes precisely because of greater forms of media participation and creation (Bucy, 2005; Norris, 2000), history, theory, and this study have identified a certain level of conditionality in time-ordered relationships between media technologies and democracy.

The target comprising ''new'' media is regularly moving, but previous research has generally found that increased access to and forms of interactive media open up more possibilities for healthy democracies but do not ensure them (Wilson, 2004). The directness and interactivity of new technologies afford more opportunities for self-expression that may overcome limited engagement (Bimber & Davis, 2003), but fractious new media audiences with advanced filtering mechanisms may constrain potential democratization (Sunstein, 2007). In addition, a large body of scholarship discusses democratic growth as originating from economic development and positions free media systems as corollaries of democracy (Bollen, 1993; Burkhart & Lewis-Beck, 1994; Helliwell, 1994). Thus, while it is imprudent to expect a democratic wave (Huntington, 1991) as a result of such media diffusing around the world, the evidence presented here also suggests that influence of media upon democratic growth may be greater than previously outlined.

The difficulty in realizing the direct and indirect roles that media have played in augmenting national-level democratic growth seems to have been obscured by the conditionality of such effects. It might well be that communication scholars have a tendency to overstate the democratic necessity of communication technologies while other political and social scientists often underutilize media as potential causal mechanisms in the democratization process. The study reported here offers a bridge between different research traditions and paradigms of effects and noneffects. When media networks are highly diffused and thereby fulfill more central information functions, or during periods of increased sociopolitical instability due to conflict and change, these media systems are likely to positively impact democratic growth. If neither of those conditions is met, or if the prevailing national regime is highly autocratic, there is a reduced likelihood that the process of democracy will be directly advanced through media or any other social characteristics included in this study. The indirect impacts of certain communication technologies' diffusion can, however, still be observed as cultivating sociopolitical instability.

Moreover, the high-media and high-instability conditions identified here that set the stage for media diffusion to Granger-cause democratic growth are the exact same conditions in which increased income levels were also observed to have Granger-caused democratic growth. Although national economic levels were not the principal foci of this empirical investigation, the long-standing economic development thesis seems to be integrated with the framework of MSD theory through this finding. Traditional and new media should therefore be conceived of and applied as macrolevel factors that might well contribute to democratic linkages with other social forces such as income and sociopolitical instability.

Democratization is a complex, often unpredictable phenomenon and the study reported here is imperfect in that it cannot control or take into account every germane civil society, policy, media, and cultural consideration. Given that, this study has nonetheless demonstrated that communication technologies are not merely indicators of democracy; under certain conditions, media can be activated as both direct and indirect mechanisms for democratic growth.

Acknowledgments

Notes

1 Although a median split might possibly be preferable for nonnormal distributions such as those observed here, this study is based on cross-sectional time-series data. As such, the units of demarcation (media or instability) are dependent on both countries and time. The median is therefore less consistent a discriminator than the mean when conceptualizing the cut-off point as a measure of all figures over time or average figures per country over time. In addition, previous research on the impact of estimating panel data effects derived by the mean or the median has concluded that both can be effective (Carro, 2003).

2 For each of the four models examined, a first difference was taken for democracy, newspapers, income, and population. Radio and television diffusion figures achieved stationarity simply by taking a natural logarithm. Sociopolitical instability was stationary in all models but urbanism required a first difference after taking a natural logarithm. The general goal was to preserve as much variation in the original measures as possible so as to not overtransform variables and thereby misconstrue actual relationships.

3 To investigate this further, all countries were recategorized by their initial democracy score. Here, "highly autocratic" countries had starting democracy scores that ranged from −10 and −6; "less autocratic" countries comprised the range −5 to −1; "less democratic" countries were from 0 to +5; "highly democratic" countries were those that had a starting democracy level of +5 to +10. The exact same processes identified for all other Granger causality tests were used again to model Granger causality tests for each of these groups. At least one form of media Granger-caused democracy in all of the groups except the highly autocratic group. This provides more evidence that media technologies are unlikely to precipitate transformative democratic growth when civil liberties and forms of free expression are tightly controlled and suppressed.

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미디어, 불안정성 그리고 민주주의: 1946 년부터 2003 년까지 122 개국의 그래인저

인과관계 실험

요약

그래인져 인과관계 테스트의 결과들에서의 교차국가시리즈데이터를 사용해, 본 연구는

122 개 국가 샘플을 가지고 미디어 기술의 민주적 효과에 대한 분석을 단행하였다. 이

과정은 커뮤니케이션 기술들은 중요하다는 것을 밝혔으나 민주적 성장에서의

배타적이거나 보편적인 선결과제는 아니라는 것을 또한 보여 주고 있다. 미디어 체계

종속이론에의해 기대된대로, 미디어 분산은 그래인져 상호작용에 근거한 민주주의는

오로지 미디어가 정보기능적이거나 사회정치적 불안적수준이 높은 경우의 나라에서만

나타난다는 것을 보여주었다. 결과들은 더우기 미디어 분산은 사회정치적불안정의

발전에 주요 요소라는 것을 보여주고 있는데, 이는 매스미디어 분산에서의 일정정도의

직접적 그리고 간접적 메가 민주적 효과를 제안하고 있다. 여기에서 관찰된

미디어체계종속이론의 상황은 경제적 발전이론과 통합적관계를 증명하고 있다.

Los Medios, la Inestabilidad, y la Democracia: Examinando Las Relaciones Causales
de Granger de 122 Países Desde 1946 al 2003

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Resumen

Usando los datos de una serie de tiempo a través de las naciones en secuencias de las
pruebas de causalidad de Granger, este estudio analizó los efectos democráticos de las
tecnologías de los medios con una muestra de 122 países. Este proceso reveló que las
tecnologías de comunicación son vitales, pero no un pre-requisito exclusivo o universal
para el crecimiento de la democracia. Como se espera de la teoría de dependencia del
sistema de los medios, la difusión de los medios demostró tener la democracia causada de
Ganger sólo en los países donde los medios servían mayores funciones de información o
donde la inestabilidad socio-política era mayor. Los resultados indican más aún que la
difusión de los medios es central para el desarrollo de la inestabilidad socio-política, lo
cual sugiere ciertos efectos directos e indirectos de la difusión de los medios masivos a
nivel democrático macro. Las condiciones de la teoría de la dependencia del sistema de
los medios, observados aquí, demostraron también una relación integrativa con la tesis
del desarrollo económico.

Palabras claves: Democracia, difusión, teoría de dependencia del sistema de los medios,
causalidad de Granger

Les médias, l'instabilité et la démocratie : un examen des liens de causalité à la Granger dans

122 pays entre 1946 et 2003

Jacob Groshek

En utilisant des données chronologiques dans le cadre d'une série de tests de liens de causalité à la Granger, cette étude a analysé les effets démocratiques des technologies médiatiques sur un échantillon de 122 pays. Cette méthode a révélé que les technologies de communication sont importantes, mais qu'elles ne sont pas des préalables exclusifs ou universels à la croissance démocratique. Tel que le prévoit la théorie de la dépendance envers les systèmes médiatiques, la diffusion médiatique s'est révélée être la cause d'effets démocratiques (à la Granger) seulement dans les pays où les médias remplissaient plutôt des fonctions d'information, ou là où l'instabilité sociopolitique était plus forte. Les résultats indiquent aussi que la diffusion médiatique est essentielle au développement de l'instabilité sociopolitique, ce qui suggère certains effets démocratiques macro, directs et indirects, de la diffusion médiatique de masse. Les conditions de la théorie de la dépendance envers les systèmes médiatiques observées ici démontrent également une association d'intégration avec la thèse du développement économique.

Mots clés : démocratie, diffusion, théorie de la dépendance envers les systèmes médiatiques, liens de causalité à la Granger

媒体、动荡和民主：1946 年至 2003 年 122 个国家的 Granger 因果关系

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【摘要 :】

本文运用跨国时间序列 Granger 因果检验的数据，分析了以 122 个国家作为样本的媒体技术的民主效果。这个过程揭示了传播技术对民主至关重要，但并非是民主增长的唯一和通用的先决条件。正如媒介系统从属关系理论所预期的那样，只有在媒体有较多的信息功能或社会政治不稳定水平较高的国家媒介扩散才能产生 Granger 引起的民主。结果进一步表明媒介扩散对社会政治动荡的发展至关重要,这表明大众媒体传播的某些直接和间接的宏观民主影响。媒介系统从属理论也与经济发展论题有综合关

Medien, Instabilität und Demokratie: Eine Untersuchung der Granger-Kausalbeziehungen von 122 Ländern zwischen 1946 und 2003

Wir bedienen uns länderübergreifenden Zeitreihendaten in Sequenzen von Granger-Kausalitätstests, um die demokratischen Wirkungen von Medientechnologien in einer Stichprobe von 122 Ländern zu untersuchen. Dieser Prozess zeigt, dass Kommunikationstechnologien zwar vitale, nicht aber exklusive oder universelle Voraussetzungen für demokratisches Wachstum sind. Im Einklang mit den Annahmen der Theorie der Mediensystemabhängigkeit wurde gezeigt, dass Mediendiffussion nur dann eine Granger-bedingte Demokratie hat, wenn Medien eher eine informative Funktion haben oder die soziopolitische Lage instabil war. Die Ergebnisse zeigen außerdem, dass Mediendiffusion ein zentraler Faktor für soziopolitische Instabilität ist, was den Schluss zulässt, dass es bestimme direkte und indirekte demokratische Wirkungen von massenmedialer Diffusion auf Makroebene gibt. Die Bedingungen der Mediensystemabhängigkeitstheorie, die hier untersucht wurden, zeigen auch eine integrative Beziehung mit der These der ökonomischen Entwicklung.

Schlüsselbegriffe: Demokratie, Theorie der Mediensystemabhängigkeit, Granger-Kausalität