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Social Correlates of Public Attitudes Toward New Communication Technologies

Age plays an important role in attitudes about the future of communication technology.

► In recent years the public has been deluged with talk of an information society with its associated new communication technologies. Information-related work has grown to represent more than half the U.S. gross national product,¹ while the growth of electronically transmitted information has been extraordinary.² In addition to these societal signposts, the marriage of computer and telecommunications has vastly expanded the potential availability of information in the home. These developments have led to a tremendous amount of discussion over what impact these new technologies will

have on individuals and society. This study examines public attitudes toward some of these information society issues, their dimensions and demographic predictors. Although this report focuses on communications, it contributes to a more general line of research concerned with the public's views on science and technology.

It seems that the public has never been of one mind regarding science and technology. A 1963 survey, for example, showed people regarded the computer as an awesome but useful machine.³ The early 1970s saw several studies which sought to test popular generalizations about an anti-technology movement symbolized by Reich's *Greening of America*.⁴ In spite of growing awareness of technological drawbacks and concerns over ecology, the public's regard for technology

¹ Marc U. Porat, "Global Implications of the Information Society," *Journal of Communication*, Winter, 1978, pp 70-80.

² Ithiel de sola Pool, "Tracking the Flow of Information," *Science* 221:609-613 (August, 1983).

³ Robert S. Lee, "Social Attitudes and the Computer Revolution," *Public Opinion Quarterly*, 34:53-59 (Spring, 1971).

⁴ Charles Resch, *Greening of America* (New York: Random House, 1970).

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remained largely positive.⁵ These studies also showed, however, that public opinion was not reducible to a single anti or pro technology view,⁶ but that at least two dimensions, affect and utility, were useful in identifying patterns of attitudes.⁷ As an example of somewhat contradictory opinions, one study found that a little more than half of a national sample thought computers were dehumanizing people and making them overly dependent, while a greater percentage believed computers would improve life.⁸ By the early 1980s, however, technology had become closer to everyday experience. Computers in particular have become household products, while other new communication products have received massive promotion. The consumerization of technology has stimulated the mass marketing machinery, elevating the public's awareness of new communication technology.

A review of academic discussions of the information society issues may help guide an examination of the way the public views them. Research into the potential societal impacts of the new communications media is relatively new. The more optimistic futurists have reviewed what new media will likely be available and how they may be used (e.g., interactive videotex allowing citizens to vote at home). These writers see uses which are primarily beneficial to the individual and functional for society. Frederick Williams, for instance, examines new technologies from the individual level, predicting how they might further personal goals through more reliable, efficient, and flexible communication.⁹ This focus on the individual is more clearly seen in his view that "It is what we can do with communications rather than what it does to us that is ultimately important."¹⁰

Others have adopted a more critical social system approach in their predictions. As Mosco notes, technologies affect society "only through their differential effects on individuals, organizations, and classes in society."¹¹ This sensitivity to distributional aspects has led researchers to question whether new media will equalize access to information or will polarize it.¹²

Previous research exploring "knowledge gaps," as social dysfunctions of communications, suggests that the latter may be the more plausible outcome — when information is introduced into a society, high status groups acquire it at faster rates than others.¹³ Schiller¹⁴ and Mosco¹⁵ are among the more negative scenarists, regarding new technologies not as consumer products, but as tools to further the domination and hegemony of existing power elites. In such a view, equal access to the new media matters not so much as who controls communication content flowing through those media.

Beyond these debates in academic circles and in the popular press, it is unclear how the public regards issues relating to the new technologies and the information society. Bowes notes that there have been few attempts to assess public attitudes toward the new media and their uses.¹⁶ The limited work done has focused on computers.¹⁷

Todd R. LaPorte and Daniel Metlay, "Technology Observed: Attitudes of a Wary Public," *Science*, 188:121-127 (April, 1975); Irene Taviss, "A Survey of Popular Attitudes Toward Technology," *Technology and Culture*, 13:606-621 (October, 1972).

⁵ Roy D. Goldman, Bruce B. Platt and Robert M. Kaplan, "Dimensions of Attitudes Toward Technology," *Journal of Applied Psychology*, 57:184-187 (April, 1973); LaPorte and Metlay, *op. cit.*

⁷ Richard Anderson and Mark Lipsey, "Energy Conservation and Attitudes Toward Technology," *Public Opinion Quarterly*, 42:17-30 (Spring, 1978).

⁸ AFPIS/TIME, *A National Survey of the Public's Attitudes Toward Computers* (New York: AFPIS, Time, 1971).

⁹ Frederick Williams, *The Communications Revolution* (New York: Mentor, 1983).

¹⁰ Williams, *op. cit.*, p. 239.

Vincent Mosco, *Pushbutton Fantasies* (Norwood, N.J.: Ablex, 1982).

¹² John Tydemann and Lois Zwimpfer, "Videotex in the United States — Toward Information Diversity," in *Videotex '81* (Middlesex, U.K. Online Conferences, 1981).

¹³ Philip J. Tichenor, George A. Donohue and Clarence N. Olen, "Mass Media Flow and Differential Growth in Knowledge," *Public Opinion Quarterly*, 34:159-70 (Summer, 1970).

¹⁴ Herbert I. Schiller, *Who Knows: Information in the Age of the Fortune 500* (Norwood, N.J.: Ablex, 1981).

¹⁵ Mosco, *op. cit.*

¹⁶ John E. Bowes, "Media Technology Detour or Panacea for Resolving Urban Information Needs," *Journal of Broadcasting*, 20:333-343 (Summer, 1976).

¹⁷ See, for example, Mary L. Dickerson and James W. Gentry, "Characteristics of Adopters and Non-Adopters of Home Computers," *Journal of Consumer Research*, 10:225-235 (September, 1983) and Stanley T. Weardon, Douglas W. Hughes

(Footnote continued)

Attitudes Toward New Media

This study explores public attitudes toward a variety of new technology issues, as well as the public's predictions of adoption rates for specific new media. In addition to describing these attitudes, two related research questions are addressed: can a group of attitudes be specified which form a single dimension of relative optimism or pessimism toward the social impacts of new technologies across several distinct issues, and how are such attitudes related to location in the social structure (age, education and income level)?

Attitudes toward five issues are examined, as well as adoption predictions that people make. The first two relate to the relative distribution of the new media in society: to what extent do people perceive that the new technologies will be generally affordable and of benefit to all parts of society? If individuals use their own status as a clue to overall social impacts, we might expect those with higher social status to be less concerned about potential communication "gaps." Studies already show that those with higher levels of education and income are more likely to think technology has made life better¹⁸ and have a higher regard for the contributions of science and technology.¹⁹

Another attitude is related to a concern about privacy that has been frequently voiced concerning the new technologies. Fear that others may use the new media to invade people's privacy has been documented by Martin and Norman.²⁰ A more positive function of new technologies like videotex, and even video cassette recorders, is allowing individuals more control over their communication environment. The range of information options is expanded, as is the flexibility in selecting

and Jane D. Brown, "Psychological and Demographic Predictors of Attitudes Toward Microcomputers," paper presented to the Association for Education in Journalism and Mass Communication conference, Gainesville, Florida (1984).

¹⁸ AFPIS/Time, *op. cit.*

¹⁹ Science Indicators, "Public Attitudes Toward Science and Technology," Report of the National Science Board, No. 3800-00146 (Washington, D.C.: U.S. Government Printing Office, 1973) pp. 96-100.

²⁰ James T. Martin and Adrian R. D. Norman, *The Computerized Society* (Englewood Cliffs, N.J.: Prentice-Hall, 1970).

²¹ Science Indicators, *op. cit.*

and using that information. This study examines whether or not people perceive that the new technologies would indeed give them greater control over what they watch and read.

The final attitude addressed in this study is the importance people attach to computer literacy. In spite of manufacturer's claims of "user friendliness," many do not feel comfortable with computers. Whether or not these feelings toward computers are related to the more general attitudes mentioned above remains to be seen.

In addition to the general attitudes relating to relative affordability and benefit mentioned earlier, this study asks individuals to predict specifically what percentages of people will eventually adopt a state-of-the-art interactive cable system. Although the absolute percentages may vary widely depending on how much an individual believes some of the more optimistic predictions, of particular interest is what distinction people make between their own rate of adoption and that of others. Discrepancies would indicate perceptions of potential communication "gaps" and may be predicted by demographic variables.

The predictor variables examined are age, education and income. Age may indicate generational differences in attitudes toward new technologies. The young, although negative about past contributions of science and technology, tend to see the future more positively.²¹ Younger people have had early experience with video screens and many are introduced to computers at school. Adults, on the other hand, often regard computers and new devices with suspicion. Education and income are indicators of socio-economic status and predict the need for information or the means to obtain it. This study seeks to determine how relative advantage in the social structure affects perceptions of new technology issues, particularly those relating to gaps between the information rich and poor.

Methods

Sample. Between February and May of 1984, telephone interviews were conducted

with 1,076 Texas residents over the age of 18, using a random digit dialing technique. Two-hundred telephone exchanges were drawn at random without replacement from a list of all state exchanges, a working "seed" bank in exchange established, and 10 random two-digit numbers attached to each seed number (e.g., (512) 345-13—) to create the numbers in each of 200 "clusters."²² Four interviews were attempted in each cluster for a target sample size of 800.²³ Interviewers asked for a male or female resident at random and made as many as five call-backs on different days to reach a respondent. Only after five such unsuccessful attempts or if the number was non-working or a business, was it replaced with another from the cluster. The proportion of those contacted agreeing to be interviewed was 79%.²⁴

Measures. The questionnaire contained a number of Likert-type items devised to measure technology attitudes. Respondents were asked to express level of agreement with five statements after a brief introduction about the new communication technologies.²⁵ The statements dealt with the relative affordability of the new communications media, the relative benefit to different parts of society, the ability of the government to use new technologies to invade people's privacy, personal control over what is watched and read, and the need to know about computers. The items were coded so that higher values correspond to positive or optimistic responses.

In addition, respondents were read a description of a "state-of-the-art" cable system, and asked what percentage of people "like themselves" would eventually get it as opposed to the percentage of people "overall in Texas."²⁶ Age, education and income were measured by asking respondents their age at their last birthday, the highest level of education completed,²⁷ and their total family income.²⁸

Results

As a state, Texas approximated national adoption figures at the time of the survey: 42% of households had cable, (of those, 66% had some premium service like

HBO), 16% had a video cassette recorder, while 14% owned a home computer. Table 1 shows how respondents answered the five technology attitude items. There is variance across the response categories, and optimistic/positive responses (i.e., disagreeing with the first three and agreeing with the last two) do not seem to predominate. Most (57%) agree or strongly agree that the new communication technologies will not be generally affordable, although slightly more than half (51%) reject the idea that such technologies will benefit only the few. For the items aimed at the individual's relationship with the new media, most answered in the positive direction: 58% thought the new technology would give them greater control over their information consumption, and an even higher proportion (69%) agreed that

²² In a full telephone number (e.g., (512)-345-1300) the three digits following the area code represent the exchange, while the next two digits identify the "bank" (13). Not all banks are assigned in many exchanges so a randomly generated four-digit number was attached to each exchange number and called until a working "seed" bank in each exchange was identified.

²³ One of the goals of the larger study was to describe Mexican-Americans in the state. Consequently, those exchanges yielding two or more Hispanic interviews were oversampled to reach the final N of 1,076. Those exchange clusters were weighted accordingly when computing descriptive statistics of the total population, producing a weighted N of 800. The sample was unweighted for the other analyses reported.

²⁴ The completion rate was 56% (completed interview)/[(total numbers called)-(numbers out of service + numbers changed + business numbers + non-eligible respondents.)]

²⁵ The introduction to this section and first statement read, "There has been a lot of talk about how we are in the computer and information age. New communication technologies will provide many new ways of sending and receiving information. Naturally, there is disagreement over whether this is good or bad. We are interested in your opinions on some of these issues. Take this statement for example: Only a small percentage of people will be able to afford these new communication devices. Would you — agree strongly, agree, no opinion, disagree, or disagree strongly?"

²⁶ The introduction and predictions read as follows: "Some places in Texas have a special cable service, which allows people to call up information they want, cast votes, shop and bank at home. Their homes can also be monitored by police and fire departments to guard against fire and break-ins. If services like these were available in your area, what percentage of people like yourself do you think would eventually get them? What percentage of people overall in Texas do you think would eventually get these types of services?" Warner-Amex had introduced its Qube cable system in Houston and Dallas well before the survey was conducted.

²⁷ Education categories: "Some grade school, completed grade school, some high school, completed high school, some college or trade school, completed college, some graduate school, completed graduate school."

²⁸ Income categories: "under \$10,000, \$10 to \$20,000, \$20 to \$30,000, \$30 to \$40,000, \$40 to \$50,000, \$50 to \$60,000, more than \$60,000."

TABLE I

Public Attitudes Toward the New Technologies

Item	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1) Only a small percentage of people will be able to afford these new communication devices. (N = 797)	12%	45%	11%	28%	5%
2) All these new communication technologies will benefit only a small part of society. (N = 794)	6	34	10	45	6
3) The government will be able to use new communication technology to invade people's privacy. (N = 791)	10	42	16	29	4
4) The new communication technology would give me greater control over what I watch and read. (N = 790)	5	53	19	22	1
5) Today it is essential that everyone knows about computers. (N = 797)	15	54	4	25	1

Note: Percentages are from weighted sample, N = 800.

the computer was something that everyone should know about. On the other hand, a slight majority (52%) thought the new technologies would permit the government to invade people's privacy.

Examining the inter-correlations (Pearson r 's) between these attitudes (Table 2) shows that, although they are all roughly related (reliability $\alpha = .46$), there is not a strong underlying dimension based on an optimistic/pessimistic or positive/negative pattern of responses. The first two attitudes, relative affordability and benefit, produced the highest correlation (.54, $\alpha = .70$), suggesting that together they indicate a single general attitude regarding the relative distribution of the new technologies in society. The next highest inter-attitude correlation (.20) is between the computer and personal control items, showing that to some extent respondents associate familiarity with computers and enhanced control over their information seeking.

Table 2 also shows the relationships between the demographic variables and individual attitudes. Age is the most consistent predictor, associated with more pessimistic or negative responses for all five attitudes. Older respondents are more

likely to agree that the new media will be for only the few, that their privacy could be invaded, and that their control over information would not be enhanced nor familiarity with computers required. Education and income, however, produced the opposite effects for the first two items, but were not significantly related to the others (except that those with higher incomes tended to perceive a greater need to know about computers). Greater socio-economic status, then, produces a more positive outlook on the prospects for information equity.

The inter-correlations among age, education and income show that older respondents also tended to have less formal education and lower income. Therefore, to guard against spurious relationships between demographic factors and attitudes, multiple regression was used to identify the unique contributions of one factor while controlling for the other two.

The regression results mirror those in the correlation matrix: age is the most consistent predictor, failing to achieve significance only for the privacy item. Education and income contribute only to perceptions of affordability and social benefit.

TABLE 2

Zero-order Correlation Matrix

	1.	2.	3.	4.	5.	6.	7.	8.
Affordability								
Benefit	.54							
Control	N.S.	.10						
Privacy	.09	.15	.08					
Computer	.06	.13	.20	.06				
Age	-.14	-.21	-.18	-.07	-.18			
Education	.24	.28	N.S.	N.S.	N.S.	-.24		
Income	.22	.23	N.S.	N.S.	.06	-.14	.44	

Correlations and corresponding significance levels for N of 1,076:

$$r = .06, p = .05$$

$$r = .07, p = .01$$

$$r = .10, p = .001$$

TABLE 3

Multiple Regression of Demographic Factors on New Technology Attitudes

	Education		Income		Age		Mult. R	F	R ²
	Beta	F	Beta	F	Beta	F			
Attitude:									
Affordability	.17	14.4*	.12	14.4*	-.08	6.6**	.28	30.1*	.08
Benefit	.19	30.3*	.13	14.0*	-.15	21.8*	.34	45.2*	.11
Privacy	.03	0.3	-.02	3.4	-.06	0.6	.07	1.7	.01
Control	-.01	0.01	.01	0.01	-.18	29.5*	.18	11.6*	.03
Computer	-.01	0.12	.04	1.1	-.18	28.9*	.18	12.2*	.03

*p < .001

**p < .01

Note: The beta values represent the contribution of each variable, controlling for the other two. Positive values indicate a prediction of positive/functional levels of each attitude item. Degrees of freedom for each equation (row) are 3 and 1,072, and 1 and 1,072 for each beta weight.

Another approach to measuring attitudes toward the new technologies asked respondents to predict eventual adoption of interactive cable, both for people like themselves and people overall in the state. This was an attempt to discover possible perceived "gaps" between an individual's own reference group and the population

as a whole.²⁹ Table 4 shows that younger respondents predict a higher adoption rate, both for people like themselves and people overall, than the older groups. The

²⁹ It was assumed that a respondent would use socio-economic status as a basis for determining reference group, although it was left to the individual to decide what "people like yourself" meant.

three age groups between 18 and 54 also predict a higher rate of adoption for people overall than for themselves. This gap closes for the 55 and older group. The findings for the older respondents should be interpreted with caution, however. Although four roughly equal groups were created for analyzing age differences, half the over 55 group would not venture one or the other predictions.

Table 5 shows that although the adoption rate for one's own group is highest among the least educated, the prediction for overall adoption is even higher (61%). Although the predicted adoption for one's own group drops for the high school educated and above, the overall estimate drops as well. For those with at least a college degree the gap is non-existent. The same pattern of responses holds for income, as seen in Table 6. Those same respondents with higher education and income levels who rated the new technologies relatively affordable and beneficial to all parts of society also see little difference between their own and overall adoption. It is interesting to note that the gap is closed in both instances by a lower *overall* adoption prediction by those with more education and income, not by an increase in the predicted adoption by their own group.

Summary and Discussion

This study sought to extend the discussion of the potential impacts of the new communication technologies beyond that taking place in the academic and popular press by examining public attitudes. Those attitudes toward the new media were examined both for underlying dimensions or structure and to determine to what extent they were predicted by demographic factors. Most respondents in this study may be characterized as holding optimistic views toward the personal aspects of new media: they felt technology would give them greater control over their information consumption, and that knowing about computers is essential. The responses to the other items were more complex. No strong underlying dimension was found for the technology attitudes,

although they were all positively associated.

Because so many writers have painted glowing scenarios of what the new technologies will do to release individual potential, it would have seemed logical that individual optimism toward such technologies would have been directly linked to education and income. Education provides an awareness and need for greater amounts of information and control over it, while income provides the means to have it. Ironically, these socioeconomic status variables were linked most strongly to relative benefit and affordability and not to greater personal control or the need to know about computers.

The wealthier individuals were less concerned about the possibility of communication "gaps," and, in fact, their adoption predictions for their own group and for others were quite similar. Those with higher education and income levels seem more likely to believe the information access and equity scenario, that the new technologies will provide the electronic equivalent of Head Start. The less educated and lower paid are more likely to perceive widening disparities arising from the introduction of new communication media. These are, admittedly, projections from the data reported above, but they suggest important questions for future studies. What factors are associated with both perceived, as well as actual, future communication gaps?

Beyond education and income, this study shows that age is a moderately strong predictor for all but the privacy-related attitude. Even after controlling for S.E.S. measures, age is associated with negative or pessimistic views on all the remaining attitude items. It remains to be seen whether this is a life-cycle or generational phenomenon. Do older people feel they won't be around long enough to realize the potential benefits of new technologies or do they think they lack and may never achieve the easy facility that the Television Generation seems to have with electronic gadgetry?

(Text continued on page 692)

TABLE 4

Effects of Age on Predictions of Eventual Interactive Cable Adoption

Age	18-27	28-37	38-54	55+	F	d.f.	p
Reference Group Adoption Prediction	46%	43%	39%	43%	4.1	(3,885)	.006
Overall Adoption Prediction	54%	48%	46%	45%	6.6	(3,885)	.0002
Correlated T -	5.3	3.8	3.4	1.0			
2 - tail p =	.0001	.0001	.001	N.S.			
d.f. -	236	254	192	128			

Note: Percentages are the mean response in each subgroup

TABLE 5

Effects of Education on Predictions of Eventual Interactive Cable Adoption

Education	1.	2.	3.	4.	F	d.f.	p
Reference Group Adoption Prediction	51%	40%	42%	43%	3.0	(3,888)	.03
Overall Adoption Prediction	61%	49%	49%	42%	16.7	(3,857)	.0001
Correlated T -	4.2	6.3	4.3	.22			
2 - tail p =	.0001	.0001	.0001	N.S.			
d.f. -	124	232	229	227			

Note: Education

1. Some grade school — some high school
2. Completed high school
3. Some college & trade school
4. Completed college & above

Percentages are the mean response in each subgroup.

TABLE 6

Effects of Family Income on Predictions of Eventual Interactive Cable Adoption

Family Income	1	2	3	4	F	d.f.	p
Reference Group Adoption Prediction	47%	43%	40%	43%	1.4	(3,812)	N.S.
Overall Adoption Prediction	58%	53%	48%	43%	15.4	(3,791)	.0001
Correlated T -	5.3	5.2	4.6	.58			
2 - tail p =	.0001	.0001	.0001	N.S.			
d.f. -	116	167	186	282			

Note: Family Income

- 1 = Under \$10,000
- 2 = \$10,000 - \$19,999
- 3 = \$20,000 - \$29,999
- 4 = \$30,000 & more

Percentages are the mean response in each subgroup.

(Please turn to page 692)

Conclusions

This comparative study of U.S. television, radio and daily newspaper journalists indicates that television journalists are strikingly more similar to daily newspaper journalists in size of editorial staff, in political party affiliation, perceptions of journalistic roles and ethics, education levels and professional reading patterns than they are to radio journalists, supporting the findings of earlier studies by Ismach and Dennis, and Pollard.²¹ This suggests that the traditional "print-broadcast" distinction frequently made between journalists is often not valid.²² The differences between radio and television journalists in the United States are substantial according to our national data from 1982-83. Because of these differences in some of the indicators of professionalism, scholars and practitioners of journalism should use care in categorizing journalists as either print or broadcast.

Our study also suggests that differences between the professionalism of newspaper

and television journalists are less than those between television and radio journalists. We did find some differences between print and broadcast journalists, including age, racial composition, coverage of a beat, amount of editing of stories and importance of developing a specialty, but these differences tended to be in demographics and working patterns rather than in indicators of professionalism such as perceived roles, ethics, education and professional reading habits.

The implications of these findings for quality and kind of news reporting cannot be systematically examined in this study because we did not collect samples of the content of the media included here. Further research is needed to test the hypothesis that more investigative and interpretive reporting is done by daily newspaper and television journalists than by radio reporters.

²¹ Ismach and Dennis, *op. cit.*, and Pollard, *op. cit.*

²² Becker, *op. cit.*

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There are obviously many more social and individual factors which may color perceptions of information age issues. Ethnic background, for example, affects how advantageously one is located that blacks and Hispanics perceive the same gaps arising between themselves and the dominant culture that lower S.E.S. groups in general see.³⁰ Another factor may be occupation, specifically the extent to which one engages in information-related work. One's attitudes toward information society issues may depend on whether technology is likely to enhance one's work, alter it, or eliminate it altogether.

In any case, a focus on individual perceptions and behaviors relating to the new

communication technologies will help determine to what extent and in what form predictions by manufacturers and futurists are filtering down to the public. The extent to which individuals regard technology as enhancing equity, personal control, and freedom from intrusions may serve as an important predictor of the eventual social impact of the new communication age.

³⁰ Non-white respondents combine pessimism regarding the distributional aspects of the new technologies with optimism toward its potential personal benefits, even after controlling for S.E.S. A report to the Gannett Foundation is available from the authors.

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