The Effect of Ambiguity on the Implementation of a Social Change Initiative

Boris H. J. M. Brummans
Texas A&M University

Katherine Miller
Texas A&M University

Recent debate in the social sciences and the communication discipline has considered the value of ambiguity and uncertainty in a variety of contexts. This research considered the context of a community-level change regarding health care, and investigated the impact of perceived ambiguity on beliefs about the likely success of the initiative. Interviews with 48 key participants were content analyzed in terms of statements regarding ambiguity and beliefs about implementation. Results indicated that respondents overwhelmingly talked about situations of high ambiguity and overwhelmingly viewed these situations of uncertainty as detrimental to the initiative's success.

> Ortega y Gasset once remarked that 'life is fired at us point-blank.' We cannot say: 'Hold it! I am not quite ready. Wait until I have sorted things out.' Decisions have to be taken that we are not ready for; aims have to be chosen that we cannot see clearly. (Schumacher, 1995, p. 15)

It has been frequently noted that the "information age" has brought with it a society characterized by fast-moving change. Our private lives are marked by change, as are our experiences in the organizations we work in, and the communities that we call

Boris Brummans (M.A., Michigan State University, 2000) is a doctoral candidate in the Department of Communication at Texas A&M University. **Katherine Miller** (Ph.D., University of Southern California, 1985) is a professor in the Department of Communication at Texas A&M University. This paper originated from the first author's unpublished Master's thesis, completed at Michigan State University. The authors would like to thank James W. Dearing, William A. Donohue, and Peter K. Manning for their helpful comments and suggestions. This research was made possible by the generous support of the W.K. Kellogg Foundation, Battle Creek, Michigan, for the Comprehensive Community Health Models of Michigan. Correspondence can be sent to: Katherine Miller, Department of Communication, Texas A&M University, Mail Stop 4234, College Station, TX .

COMMUNICATION RESEARCH REPORTS, Volume 21, Number 1, pages 1-10

home. There are times when these changes are just part and parcel of life in the postmodern world, but there are other times when the change at hand is purposeful. For example, much change in organizations can be characterized as *innovative planned changes* that are "brought about through the purposeful efforts of organizational members" (Lewis, 1997, p. 456). Further, at the community level, many private foundations such as the W.K. Kellogg Foundation, the Robert Wood Johnson Foundation, and the Annie E. Casey Foundation are working to institute planned change at the community level, particularly in areas such as health care and education.

This research note looks at a small slice of such change processes by examining the effects of perceived ambiguity in a community-wide change initiative. To do this, we first look briefly at how organizational change and community change have traditionally been conceptualized, especially with regard to concepts such as uncertainty, ambiguity, and information flow. We then look at some recent theorizing that directly addresses ways in which ambiguity and change are intertwined. Finally, we consider research that examines the perceptions of participants in a community-wide change initiative to assess the extent to which participants involved in actual change processes see ambiguity as beneficial or detrimental to the implementation of change.

ORGANIZATIONAL AND COMMUNITY CHANGE PROCESSES

Everett Rogers was perhaps the first communication scholar to take a serious look at the change process. In Rogers' (1995) terms, organizational and community change can be seen an innovations, in that community and organizational members, who have direct and indirect contact with the innovation during their formal and informal activities, perceive the changes proposed as new. As a result, Rogers argues, the implementation of community and organizational change oftentimes involves a high degree of perceived uncertainty and ambiguity. He notes that, "the more 'radical' an innovation ... the more uncertainty it creates and the more difficult it is to implement" (1995, p. 397).

Scholars looking more specifically at organizational and community change have traditionally echoed the sentiment that change involves uncertainty and ambiguity, and that successful change will involve the *reduction* of that uncertainty. For example, Covin and Kilman (1990) found that "failure to share information or to inform people adequately of what changes are necessary and why they are necessary were viewed as having a highly negative impact [on organizational change]" (p. 239). Similarly, Miller and Monge (1985) found that information sharing during organizational change reduced anxiety and stress and improved job satisfaction; in this regard, any (positive or negative) information regarding organizational change was found to be better than no information at all. Indeed, Lewis (2000) has argued that a great deal of resistance to change can be attributed to factors such as ignorance of the change and inadequate training. Thus, in the view of much traditional work on organizational change, uncertainty and ambiguity serve as sources of stress and resistance among those affected by the change and thus should be reduced to the extent possible through strategies such as employee participation in the change process (see, e.g., Lewis, 2000, Lewis & Seibold, 1998) and strategic information sharing from top management (see, e.g., Clampitt, DeKoch, & Cashman, 2000).

CURRENT THEORETICAL PERSPECTIVES ON AMBIGUITY AND CHANGE

Recent theorizing, however, has begun to question this assumption that uncertainty and ambiguity are detrimental to change processes (or to life, in general) and should be reduced to the extent possible. This questioning has come from a variety of quarters. For example, based on work in such fields as physics and cosmology, scholars advocating a "new systems theory" or "chaos theory" approach to organizations (see, e.g., Coveney & Highfield, 1995; Horgan, 1996; Wheatley, 1992) suggest that there is a great deal of value in ambiguity and uncertainty, *especially* during times of change. Horgan (1996), for example, argues that the best ideas emerge when a system is at "the edge of chaos." He explains:

> The basic idea of the edge of chaos is that nothing novel can emerge from systems with high degrees of order and stability, such as crystals; on the other hand, completely chaotic ... systems such as turbulent fluids or heated gases, are *too* formless. Truly complex things—amoebas, bond traders, and the like—happen at the border between rigid order and randomness (Horgan, 1996, pp. 196-197).

In the discipline of communication, the concepts of uncertainty and ambiguity have been interrogated with particular vigor, perhaps because one of the earliest theories created in the field of communication proposed that uncertainty *reduction* is a fundamental drive in human interaction (Berger & Calabrese, 1975). Uncertainty Reduction Theory, of course, is a theory of interpersonal communication dealing specifically with relational communication during initial interaction. However, the interest in issues of uncertainty and ambiguity has been continued by communication scholars in a broad array of subdisciplines, especially health communication and organizational communication (see, for example, Eisenberg, 1984). Indeed, a recent issue of *Communication Theory* was devoted to the theoretical consideration of uncertainty and ambiguity in communicative life (*Communication Theory*, 2001).

Two recent theoretical statements that have been particularly influential in exploring the concepts of uncertainty and ambiguity are Problematic Integration Theory (Babrow, 1992, 2001) and the related Uncertainty Management Theory (Brashers, 2001). Though explicating the full range of these theories is beyond the scope of this research note, several critical aspects of the theories should be noted. First, these theories complicate the concepts of uncertainty and ambiguity, highlighting, for instance, the notion that individuals hold beliefs about both *probability* (how likely is an event to occur) and *evaluation* (is the event a good thing or a bad thing). Second, these theories explicitly *reject* the notion that uncertainty is a "bad" thing that individuals want to reduce. As Bradac (2001) states with regard to Uncertainty Management Theory:

> Sometimes people reject increased clarity, seeking instead ambiguity and even confusion. However, at other times they seek clarifying information ... The implication is that in every situation there is an optimal level of uncertainty, sometimes high and sometimes low, and that individuals will attempt to achieve that level and to maintain it. (p. 471)

So what, then, is the optimal level of uncertainty and ambiguity in community and organizational change efforts? As noted above, traditional research regarding change and innovation in organizational and community contexts would suggest that a *low* level of uncertainty and ambiguity is optimal, both for the community or organization as a whole and for the individuals involved in change. However, theorists highlighting the value of ambiguity might argue that ambiguity could lead to higher levels of innovation and to thinking about change in ways that would create novel and effective community and organizational change processes. Karl Weick (1979, 1995), for instance, argues that equivocality (that is, a situation in which multiple interpretations are possible) allows organizational actors opportunities for "acting, playing, and experimenting" (Martin, 1992, p. 157) as they make sense of their social environment. And, in the area of large-scale change, Eveland contends that "sharing information among people (and organizations) does not require perfect information, or precise specificity to be effective—sometimes ambiguity and generality can be very effective" (1987, p. 307).

The research reported here, then, explores the issue of how participants in a planned community change effort view and evaluate ambiguity. Specifically, the following research question is posed:

RQ: Do participants perceive high ambiguity in the definition of a collaborative community health improvement initiative's meaning as detrimental or beneficial to the initiative's implementation?

THE CHANGE INITIATIVE

In 1992, the W. K. Kellogg Foundation established formal partnerships with three communities in Michigan, and introduced an experimental collaborative health improvement initiative, the "Comprehensive Community Health Models Initiative," to improve the health of community residents through system-wide change. The initiative was designed to test two major assumptions. The first assumption was that the communities could identify health care needs and effectively manage health care resources to address these needs. The second assumption was that local consumers, purchasers, and providers of health care needed to be equally engaged in decision making with respect to the allocation and use of health care resources in order to improve health care provision.

The counties studied in the CCHM initiative ranged in population size from 138,000 to 172,000 residents. In these counties, relevant stakeholders in the health care industry, education, and the community at large participated in the design and implementation of projects for increasing health care capacity and health care access. The evaluation research from this project (Dearing, et al., 2002) reports that 27 projects developed through the CCHM initiative persist in these communities. These projects include, for example, a toll-free phone system for healthcare information and a large-scale referral system for clinical support services that works through one of the county's school systems. In short, this project provided an impetus for a variety of stakeholders to become involved in thinking and action about ways to improve community health access and capacity. In short, the Kellogg Foundation attempted to influence health care in these communities through legitimizing the problem of community health care and providing initial resources and infrastructure for change. The demonstration of the effective-

ness of the CCHMs in these communities (see Dearing, et al., 2002) was seen as a model for similar change in other communities across the U.S.

In terms of the structure of the CCHM initiative, the Kellogg Foundation instituted an "Operations Office," that served as a primary communication channel between the Foundation and the partnering communities. The Operations Office facilitated project planning and community development, provided technical assistance, coordinated consultants, supported the initiative's evaluation process, and facilitated federal and state governmental relations to assist the three communities in implementing policy changes.

A "Community Governing Board" was instituted in each community to establish inclusive, participatory decision-making. These boards were community-level decision making units composed of consumers, providers, and purchasers of community health care; its members determined how health care services needed to be organized, and what resources needed to be assigned to health care.

Finally, local "Program Offices" served as intermediaries between the Foundation, the Operations Office, and the communities. Program office members operated under the governance of the Foundation to provide community accountability, establish communication channels in the community, and maintain linkages to the community through work groups.

This particular initiative was selected for study because its implementation required systemic, structural change of the communities' health care systems. This plan threatened long-established patterns of resource distribution, decision making, and interorganizational practices, meaning that the initiative represented a radical innovative planned organizational change, embedding high degrees of perceived uncertainty, risk, and ambiguity.

METHODOLOGY

The present study was one component of a larger project. Three members of the larger research team conducted interviews with 48 key participants in three counties (two interviewed 18 people each and one interviewed 12 people). Interviewers worked as part of the larger research team in drafting iterative forms of the interview protocol and reviewing those drafts in terms of research needs and concerns regarding human subjects protection. The interviewers then worked together to develop interview techniques and open-ended prompts that would enhance the comparability of data across interviewers. Pilot interviews were conducted to enhance the skills of interviewees and to work out problems with the interview protocol.

The interviewees selected for inclusion in this study had been particularly active in the implementation of the initiative. The sampling of interviewees was thus purposive, with an eye toward talking to individuals with active and ongoing experience in the change initiative. The interviews were semi-structured in that explicit questions were included in the interview protocol, but open-ended responses and elaboration from interviewees was encouraged. The interview protocol was designed to elicit an understanding about four general categories of information: (1) decision making, (2) leadership, (3) changes over time in the initiative's vision, local organizations, or institutions and partnership members, and (4) sustainability of the partnership vision. All 48 interviews were audio-taped and then transcribed for content analysis.

The content analysis for this research relied on well-established traditions (see Holsti, 1969; Riffe, Lacy, & Fico, 1998). For the analysis reported in this research note, two coders were trained to code *recording units*, specific segments of content that are characterized by placement in given categories (Holsti, 1969). In this study, a recording unit was any word that indicated high or low ambiguity about the initiative. These recording units included terms such as "equivocal," "ambivalent," "obscure," "doubt," "clear," "lucid," "clarify," and "understand" as applied to the initiative and its meaning.

The *context unit* is the largest body of content that can be searched to characterize or interpret the classifications of a recording unit (Holsti, 1969). In this study, the context unit was the interviewee's answer in which a recording unit occurred. The coders used the context unit to classify the recording unit in terms of the expression of high or low ambiguity about the initiative and its meaning (independent variable). The coders then classified whether the potential adopter perceived the recording unit as beneficial or detrimental to the initiative's implementation (dependent variable).

Transcript Coding

All words that indicated ambiguity were located in the transcripts by using the word-search function of *Microsoft Word*. The words used in the search were developed through a thesaurus search of synonyms and antonyms. After the word search, one member of the research team who was well-informed about initiative determined whether the indicated words should be accepted as valid recording units. In total, 263 recording units were identified. Two trained and independent coders then determined the level of ambiguity for each recording unit through a review of the entire interview. Each coding decision was guided by the conceptual definition of ambiguity ("uncertainty about how to define the initiative's meaning and/or confusion about which of several different definitions to use") and the information provided by the context unit. For example, the recording units "clear" and "knew" in the excerpt, "It was clear from the start what had to happen. I'm sure most of us knew," indicated low ambiguity. The recording units "confusing" and "understanding" suggested high ambiguity in a sentence like, "The confusing thing was that we all had different understandings of the initiative." If several recording units in one interview answer could be coded in the same way, these recording units were combined as one recording unit. After determining the level of ambiguity in the recording units, the coders decided if the potential adopter perceived high/low ambiguity as beneficial or detrimental to the implementation of the initiative in his or her community, based on information provided by the context unit.

Analysis

To test for intercoder reliability, five randomly selected interviews were duplicated and given to both coders. Three interviews were repeated after the coders had coded their transcript to test for intracoder reliability. Coder reliability was assessed by calculating Hosti's Ratio of Coding Agreements (Holsti, 1969) and Cohen's Kappa (Cohen, 1960). The research question was investigated through the calculation of Pearson's chi-square test (to test for association) and Pearson's phi-square coefficient (to test for strength of effect through a consideration of proportion of variance accounted for).

RESULTS

Reliability Test Results

Tests of intracoder reliability indicated perfect consistency within coders. In terms of intercoder reliability, 64 recording units, from five transcripts, were coded by both coders. The ratio of coding agreement between the coders was .97 for the independent variable (high or low ambiguity), while Cohen's Kappa was .86 ($p < .01$). With regard to the dependent variable (effects of ambiguity on initiative success), the ratio of coding agreement was .95 and Cohen's Kappa was .70 ($p < .01$). These statistics were deemed satisfactory.

Content Analysis Results

The results of the content analysis were cross-tabulated (see Table 1). Low ambiguity in the definition of the initiative's meaning was perceived as detrimental to the implementation of the initiative in five percent of the total cases, while low ambiguity was perceived as beneficial in eight percent of the total cases. High ambiguity, on the other hand, was perceived as detrimental in 84 percent of the total cases and as beneficial in two percent of the total cases.

TABLE 1
Ambiguity by Implementation Cross-Tabulation

		Detrimental Effects	Beneficial Effects	Total
Low Ambiguity	Count	14	22	36
	Percentage	5%	8%	14%
High Ambiguity	Count	222	5	227
	Percentage	84%	2%	86%
Total	Count	236	27	263
	Percentage	90%	10%	100%

The outcomes provide evidence that high ambiguity was perceived to have a negative effect on implementation. This evidence was supported by a significant Pearson's Chi-Square ($\chi^2 = 117.05$, 1 df, $p < .01$). Further more, a significant, negative Pearson's Phi Coefficient ($\Phi = -.67$, $p < .01$) was found. The calculation of Pearson's Phi-Square suggested that a relatively large proportion (45%) of the variability in the dependent variable was accounted for by the independent variable. A comparison of the number of recording units per cell shows, in addition, that the definition of the initiative's meaning was most frequently perceived to be highly ambiguous.

DISCUSSION

Recent theoretical work has questioned the value of an overall allegiance to clarity and certainty in communication. Theories such as Problematic Integration Theory and Uncertainty Management Theory have questioned the widely held belief that "uncertainty is bad" (e.g., Babrow, 2001, p. 562). Instead, these theorists, and others in areas such as chaos theory and complexity theory, suggest that we need to complicate our thinking about uncertainty and examine the wide array of ways we cope with multiple meanings, incomplete meanings, contradictions, and other dilemmas of certainty in communicative life.

This research note looked at one specific instance in which uncertainty and ambiguity often flourish—the development and institution of community change. The results of this analysis revealed several findings. First, respondents in interviews about a large-scale community health change effort were *much* more likely to talk about instances of high ambiguity than low ambiguity (86 percent versus 14 percent of coding units). Respondents reported that they experienced a great deal of uncertainty and confusion, for instance, in defining the meaning of abstract concepts such as "consumer," "payer," or "provider" of health care. When asked about the development of initiatives in line with the Kellogg Foundation's stated objective of enhancing communication health care access and delivery, project participants indicated a lack of specificity regarding project goals. For example, one respondent noted, "I think they have to be more articulate in their goal ... and be able to back it up all the way down the line."

Furthermore, the respondents in these interviews clearly believed that this ambiguity was detrimental to the change effort. Of the 227 units coded as "high ambiguity" only five of the units indicated a beneficial effect of that ambiguity. In contrast, units coded as having low ambiguity were more equally divided between the detrimental (14 units) and beneficial (22 units) categories. In other words, for these respondents, clarity was sometimes seen in a negative light (perhaps when the clear vision was in contrast to the individual's vision), but ambiguity was almost *always* seen in a negative way.

This study, then, sheds some light on the question of situational characteristics that might lead individuals to prefer more or less uncertainty. Past investigations have dealt primarily with uncertainty on an intrapersonal or interpersonal level, particularly with issues of health and well-being (e.g., Brashers, Neidig, Haas, Dobbs, Cardillo, & Russell, 2000; Ford, Babrow, & Stohl, 1996; Hines, Babrow, Badzek, & Moss, 1997). Findings in these studies indicated that there are many times, in dealing with issues of life, death, and health, that individuals might prefer uncertainty and ambiguity in order to allow for multiple interpretations. Further, research in some organizational settings suggest that ambiguity may assist in creating "unified diversity" through multiple interpretations (Eisenberg, 1984) and may enhance innovative role development during organizational change efforts (Miller, Joseph, & Apker, 2000).

However, the findings from the current study suggest that there may still be times when clarity is, by far, the preferred state of affairs. For individuals participating in a large-scale community change effort, there was clearly the belief that ambiguity and uncertainty *detracted* from effectiveness. Perhaps this is because individuals in this change effort were working within a "transmission model" of interaction (Craig, 1999) where the premium was placed on getting messages through rather than on the creation of identity and meaning. This is not to suggest, of course, that ambiguity in efforts like this might not, indeed, lead to valued outcomes such as innovation and creativity. However, from the perspective of those "in the trenches," there was an overwhelming belief that change effectiveness was curtailed by ambiguous interaction.

Several limitations of this research bear mentioning. This was, of course, a single change effort regarding a very specific issue (health care) in targeted communities. Thus, future research should continue to consider alternative settings in investigating the role of ambiguity in change. Further, this research looked solely at the self-reports of participants rather than at actual interaction in meetings or at actual outcomes. Fi-

nally, because this research was looking at transcripts of interviews designed to assess general perceptions of the change process, the analysis was limited to naturally occurring mentions of ambiguity. Thus, there was a preponderance of mentions of high ambiguity and of negative impacts of ambiguity on effectiveness. Even with these limitations, however, this research provides a look at how participants in a "real world" community project with important consequences view ambiguity in the change process.

REFERENCES

Babrow, A.S. (1992). Communication and problematic integration: Understanding diverging probability and value, ambiguity, ambivalence, and impossibility. *Communication Theory, 2,* 95-130.

Babrow, A.S. (2001). Uncertainty, value, communication, and problematic integration. *Communication Theory, 51,* 553-573.

Berger, C.R., & Calabrese, R.J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Research, 1,* 99-112.

Bradac, J.J. (2001). Theory comparison: Uncertainty reduction, problematic integration, uncertainty management, and other curious constructs. *Communication Theory, 51,* 456-476.

Brashers, D.E. (2001). Communication and uncertainty management. *Communication Theory, 51,* 477-497.

Brashers, D.E., Neidig, J.L., Haas, S.M., Dobbs, L.K., Cardillo, L.W., & Russell, J.A. (2000). Communication in the management of uncertainty: The case of persons living with HIV or AIDS. *Communication Monographs, 67,* 63-84.

Clampitt, P.G., DeKoch, R.J., & Cashman, T. (2000). A strategy for communicating about uncertainty. *Academy of Management Executive, 14* (4), 41-57.

Cohen, J.A. (1960). Coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20,* 37-46.

Coveney, P., & Highfield, R. (1995). *Frontiers of chaos: The search for order in a chaotic world.* New York: Fawcett Columbine.

Covin, T.J., & Kilman, R.H. (1990). Participant perceptions of positive and negative influences on large-scale change. *Group and Organization Studies, 15,* 233-248.

Craig, R. T. (1999). Communication theory as a field. *Communication Theory, 9,* 119-161.

Dearing, J.W., Larson, R.S., Cline, G., Morrison, K., Phillips, C., Brummans, B.H.J.M., Hubbell, A., Hullett, C., Jackson-Elmoore, C., Medved, C.E., Patel, D., & Bivmostad, K. (2002). *Cluster evaluation final report and guide for strategic grantmaking with communities.* Report to the W.K. Kellogg Foundation. East Lansing, MI: Michigan State University.

Eisenberg, E.M. (1984). Ambiguity as strategy in organizational communication. *Communication Monographs, 51,* 227-242.

Eveland, J.D. (1987). Diffusion, technology transfer, and implementation: Thinking and talking about change. *Knowledge: Creating, Diffusion, Utilization, 8,* 303-322.

Ford, L.A., Babrow, A.S., & Stohl, C. (1996). Social support messages and the management of uncertainty in the experience of breast cancer: An application of problematic integration theory. *Communication Monographs, 63,* 189-207.

Hines, S.C., Babrow, A.S., Badzek, L., & Moss, A. (1997). Communication and problematic integration in end-of-life decisions: Dialysis decisions among the elderly. *Health Communication, 9*, 199-217.

Holsti, O.R. (1969). *Content analysis for the social sciences and humanities*. Menlo Park, CA: Addison-Wesley.

Horgan, J. (1996). *The end of science: Facing the limits of knowledge in the twilight of the scientific age*. Reading, MA: Addison-Wesley.

Lewis, L.K. (1997). Users' individual communicative responses to introrganizationally implemented innovations and other planned change. *Management Communication Quarterly, 10*, 455-490.

Lewis, L. K. (2000). "Blindsided by that one" and "I saw that one coming": The relative anticipation and occurrence of communication problems and other problems in implementers' hindsight. *Journal of Applied Communication Research, 28*, 44-67.

Lewis, L.K., & Seibold, D.R. (1998). Reconceptualizing organizational change implementation as a communication problem: A review of literature and research agenda. In M.E. Roloff (Ed.), *Communication yearbook 21* (pp. 93-151). Thousand Oaks, CA: Sage.

Martin, J. (1992). *Cultures in organizations: Three perspectives*. New York: Oxford University Press.

Miller, K.I., Joseph, L., & Apker, J. (2000). Strategic ambiguity in the role development process. *Journal of Applied Communication Research, 28*, 193-214.

Miller, K.I., & Monge, P.R. (1985). Social information and employee anxiety about organizational change. *Human Communication Research, 11*, 365-386.

Riffe, D., Lacy, S., & Fico, F.G. (1998). *Analyzing media messages: Using quantitative content analysis research*. Mahwah, NJ: Lawrence Erlbaum.

Rogers, E.M. (1995). *Diffusion of innovations* (4th edition). New York: Free Press.

Schumacher, E.F. (1995). *A guide for the perplexed*. London: Vintage. (Original work published by Jonathan Cape, 1977)

Weick, K.E. (1979). *The social psychology of organizing* (2nd edition). Reading, MA: Addison-Wesley.

Weick, K.E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.

Wheatley, M. (1992). *Leadership and the new science*. San Francisco: Berrett-Koehler.

Copyright of Communication Research Reports is the property of the Eastern Communication Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. This article has been reproduced with permission of the Eastern Communication Association for the development of Applied Communication Research Methods textbook under development by Jason S. Wrench, Virginia P. Richmond, Candice Thomas-Maddox, and James C. McCroskey. Users may print articles for individual use only.