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AIR FORCE MEDIA USE AND CONFORMANCE WITH MEDIA RICHNESS THEORY: IMPLICATIONS FOR E–MAIL USE AND POLICY

THESIS

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Heather L. Adams, B.S., M.S.

Captain, USAF

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Contents

Page

Illustrations

Page

Tables

Page

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Abstract

Communication has become a major aspect of a manager's job. When communicating, they are faced with many choices of what media to use — some include face–to–face, telephone, e–mail, or written. Managerial effectiveness can improve if managers make appropriate media choices. Thus, it is important to study how Air Force managers perceive media and what kind of choices they are making based on those perceptions. Media Richness Theory suggests that media choices are affected by content reasons, situational reasons, and symbolic reasons. This study examined Air Force managers and found they conform highly with Media Richness Theory in their media choices. Their perceptions of media richness also closely agreed with MRT. However, higher level managers did not conform better than lower level managers as MRT would suggest. This study supports Media Richness Theory and the model used to apply it. The results indicate that Air Force managers are making effective media choices. This gives implications for using newer media such as e–mail and creating policy for such media which is a paramount issue today.

Chapter 1

Introduction

General Issue

Managers in private industry and government organizations have been quick to incorporate advanced communications technology, such as electronic–mail (e–mail) into the workplace (White, 1986). Because of its speed and efficiency, use of e–mail has grown rapidly. Twice as many e–mail messages, 25 billion, crossed networks in 1995 than in 1993 (Greengard, 1995: 161).

E–mail expands the communications capabilities available to managers and in some cases replaces traditional media such as paper documents, telephone calls, and face–to–face communication. When the medium's capabilities are robust enough to meet communication requirements, e–mail can provide rapid, easy intra–organizational communication and coordination (Rice and Bair, 1984). When used improperly, or when its capabilities fall short of requirements, e–mail has the potential to interfere with normal decision–making and management and detract from organizational performance. Research suggests managers who are sensitive to the relationship between equivocality and media richness are more likely to be rated as high performers (Daft et al., 1987).

To ensure the Air Force obtains the maximum benefit from the new technology, leaders are considering establishing formal guidelines for the use of e–mail. As a precursor to policy development, it is necessary to understand Air Force employees' use of e–mail and their perceptions of its capabilities as compared with the capabilities of traditional media.

Media Richness Theory (MRT: Trevino et al., 1987) provides a framework for understanding communications requirements and matching those requirements to the capabilities of a given medium. MRT states that messages differ based on their content (complexity, personal or emotional nature), situational factors (time and location), and symbolic needs (conveying urgency or authority). According to MRT, these three elements determine which type of media will be most effective in meeting a given communication objective. MRT classifies media based on their "richness". For example, face–to–face conversation is the richest medium. It provides the sender with constant feedback on how well the receiver is hearing and understanding the message. When body language, facial expressions, or the receivers verbal cues indicate confusion or disinterest, the sender can change his/her approach, repeat or clarify the message, or ask for feedback. Written communication lies at the other end of the richness continuum. It offers no opportunity for feedback — at least in the short term. As a result, the range of messages that can be adequately conveyed in writing is more limited than the range that can be conveyed via face–to–face conversation. Messages that are low in ambiguity (i.e., can be easily understood) can be communicated via leaner media such as e–mail. On the other hand, messages that are high in ambiguity because they are complex, personal in nature, or

express emotions, require a richer medium — in these cases, telephone calls or face–to–face conversations are more appropriate.

Air Force media needs vary widely among organizational units and levels. On the whole the Air Force tends to favor formally written communications for official messages. This reduces information loads on decision–makers at the top of the organization by having lower echelon managers review, filter out irrelevant information, consolidate, and verify potentially important information (Webster and Trevino, 1995).

For other purposes, because of the Air Force's emphasis on symbols, tradition, and leadership, rich communications media are often required. When the objective is to show authority, status, or position, or convey personal interest or concern, static written documents or e–mail are less affective than more personal, richer media.

Since managers spend up to 85% of their time communicating (Valacich et al., 1993: 1; Adams et al., 1993: 9), choosing less–effective media for those communication tasks can be detrimental to managerial performance. E–mail is convenient and more widely available; however, it is not the best choice for every communications requirement. Researchers suggest that Media Richness Theory can be applied to understand manager's media choices and whether those choices are appropriate for various situations. However, MRT has not been tested in a government organization. This thesis examines the extent to which Air Force manager's choice of media for various communication tasks is consistent with MRT. The influence of the message originator's rank and command level on media choice was also examined. Learning how these factors influence media choice will help determine the usefulness of Media Richness Theory in an Air Force context. It will also allow for a better understanding of how e–mail is being used by Air Force managers.

Chapter 2

Literature Review

Media Richness Theory and Media Choices

Media Richness Theory is the most influential theory of media choice in the organization and information sciences today (Markus, 1994: 503). It was developed to examine the relationship between the content of managerial communication and media selection (Daft et al. 1987: 355). Originally, MRT addressed traditional intraorganizational communication media such as face–to–face and telephone. It has more recently been extended to include electronic means of communication.

Past studies used the theory in a prescriptive mode assuming that media choices influenced employees' effectiveness. Markus' (1994) results support this approach. More recently, studies have used the theory to describe and explain how *individuals* actually *perceive and select* media rather than the implications of these choices are for effectiveness. Thus, Media Richness Theory can help explain why senior managers choose to rely heavily on face–to–face meetings and telephone calls for sensitive or important communication and e–mail or written methods for routine communications (Markus, 1994: 504).

In 1987, Trevino, Lengel, and Daft first brought attention to three general reasons that managers choose particular media which were then used as the new foundations for MRT.

1. Ambiguity of the message **content** and richness of the communication medium
2. **Situational** determinants such as time and distance
3. **Symbolic** cues provided by the medium

Content Reasons

Content reasons involve ambiguity or equivocality (the latter term will be used throughout to mean both) and the richness of the medium. Media Richness Theory states that effective managers will choose different media for different situations based on task–related factors and the "richness" of the media

(Markus, 1994: 503). Richness, for media, is defined as the capacity to facilitate shared meaning, insight, and rapid understanding (Daft et al., 1987: 358). Communications that foster shared meaning, insight, and rapid understanding are considered rich.

Original research on MRT classified two relevant influences on information processing: uncertainty and equivocality. Uncertainty is defined as the absence of information and represents the difference between the amount of information required to perform a task and the amount of information already given about the task (Galbraith, 1973). Managers respond to uncertainty by acquiring information and analyzing data. They do so by asking questions and obtaining answers. Periodic reports, group meetings, rules, and procedures can be used to reduce uncertainty within an organization. Communication that is used simply to gather more information or data does not require rich media: and in fact is best supported through the use of leaner media.

Highly equivocal communication, on the other hand, *does* require rich media. Equivocality has been defined as ambiguity and the existence of multiple and conflicting interpretations about a situation (Daft et al., 1987: 357). Confusion and disagreement go hand–in–hand with equivocality. In equivocal situations, managers have to interpret the situation from vague cues (e.g., voice inflection and body language) and come up with a reasonable solution (Daft et al., 1987: 357). Thus, richer media are seen as the most appropriate choice for reducing equivocality.

The media studied in the development of MRT were ranked in their ability to process equivocal information. The ranks were based on their ability to provide feedback, the availability of a number of cues to resolve confusion, language variety, and personal focus (Daft et al., 1987: 358). Face–to–face communication was ranked the richest as it allows for rapid mutual feedback, permitting messages to be reinterpreted, clarified, and adjusted immediately. In addition, face–to–face communication conveys emotion, uses nonverbal behavior to modify and control communication exchange, and therefore allows simultaneous communication of multiple cues. Since body language and visual cues are not found with telephone communication, it is not as rich as face–to–face communication. However, it still allows for fast feedback and the use of language content and audio cues. These factors, its personal nature, and its ability to use natural language, made it second on the richness scale. Written communication fell lowest on the scale. Feedback is slow, only textual information is conveyed, voice cues are absent, and visual cues are limited (Daft et al., 1987: 359). These classifications were identified during early studies before electronic mail was introduced. Since then however, more studies have been conducted which have placed electronic mail between telephone and written communication media on

the media richness scale (Markus, 1994: 505; Valacich et al., 1993: 13–16; Schmitz and Fulk, 1991: 488). Figure 1 shows where each medium falls in level of richness:

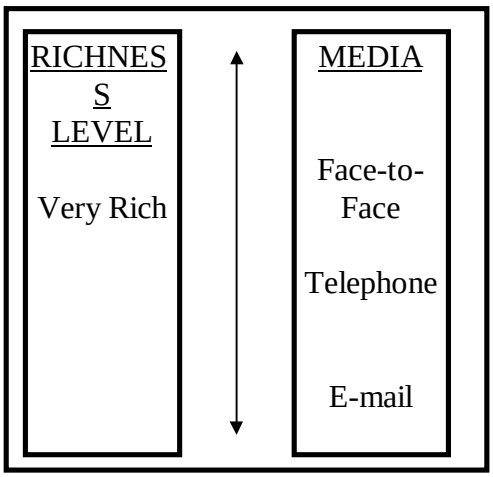

Figure 1. Relative Levels of Richness

Since many decision–making tasks have at least some equivocal aspect, managers frequently have to interpret vague cues and negotiate solutions. Equivocal situations are novel and nonrecurring and require hunches, discussion, and social support (Daft et al., 1987: 357). Newer information systems, such as electronic mail, are not well suited to problems involving equivocality (Daft et al., 1987). When a medium is chosen that provides information that is needed to resolve the equivocality of a message, MRT researchers conclude that more effective communication will result (Webster and Trevino, 1995: 1568).

Situational Reasons

Situational reasons effect media choices as well. Certain situational determinants constrain media choice behavior while others may expand manager's choices. Distance, expediency, structure, and role expectations can all constrain media choice. On the other

hand, determinants such as availability and access to certain media are considered situational *enablers* (Trevino et. al., 1987: 559). If people do not have access to electronic mail, that choice is obviously eliminated.

Two other situational determinants have been identified in previous research: geographic dispersion and job pressure (Steinfield and Fulk, 1986). As communication technology has advanced, the importance of distance has diminished. Since capabilities such as e–mail and teleconferencing are available, face–to–face communication may not be required, allowing organizations to less save time and money. Job and time pressure can also influence media choices. Steinfield and Fulk (1986) found that managers were more likely to use the telephone when acting under time pressure, regardless of the degree of equivocality inherent in the situation. It is possible that e–mail offers managers a means to alleviate some of the time pressures they are constantly faced with. Situational reasons like this need to be examined to determine how much they influence managers' media choices.

Symbolic Reasons

Considering symbolic cues of the medium itself is also important in making media choices. Feldman and March (1981) suggest that managerial communication behavior often represents "ritualistic responses" to the need to appear rational, legitimate, competent, and intelligent. They offer that some managers may request more data than needed or send out professional–looking reports in an attempt to show that their decision was rational and legitimate. On the other hand, face–to–face communication is more useful to symbolize caring or concern. For example, using e–mail to congratulate someone on a major promotion instead of doing so in person may convey a lack of

concern. In addition, using new technologies may symbolize a high–tech scientific quality or desired image of status (Johansen et. al., 1979). Written communication on the other hand, may be used to symbolize authority. "...The medium of communication may be selected for symbolic meaning that transcends the explicit message (Trevino et. al., 1987)."

Markus' (1994) study revealed how closely members of a civilian risk management organization conformed with MRT in their choices of media. She constructed 18 scenarios — six based on content criteria, six based on situational criteria, and six based on symbolic criteria. Using 50% as the criteria for agreement with MRT, she found that managers failed to agree with MRT predictions in only three of the 18 scenarios. Most of the time, these managers chose the media that MRT would say is the most appropriate. Since she found these risk management employees to follow this theory fairly closely, it is important to study it in different contexts. The assumption is that following this theory leads to more effective management. This study will use Markus' model in an Air Force context to see if Air Force managers respond to associated scenarios with similar results.

RQ1: Does MRT explain Air Force members' choices of communication media?

H1a: When scenarios are presented that involve content determinants, Air Force members will select media that meet MRT criteria.

H1b: When scenarios are presented that involve situational determinants, Air Force members will select media that meet MRT criteria.

H1c: When scenarios are presented that involve symbolic determinants, Air Force members will select media that meet MRT criteria.

Managerial Level and Media Choices

In her description of MRT, Markus (1994) suggests senior level managers are more media sensitive than lower level managers — they are more likely to choose media that is most effective for the task at hand (Daft and Lengel, 1984: 211; Markus, 1994: 506). Her suggestion is based on Daft et al.'s (1987) conclusion that media sensitive managers are higher performers. "Daft et al. (1987) found that managers whose perceptions of media conformed with the theory's prescriptions, had received generally higher performance appraisals than managers with non–conforming perceptions (Markus, 1994)." Markus (1994) found that senior managers (i.e., those at higher levels within the organization) showed a greater sensitivity than those at lower hierarchical levels for content reasons ($p<.02$, two–tailed; $N=331$). The same should be true in the military. That is, senior managers should be more media sensitive because typically their jobs involve more communication. This should make them more attuned to media capabilities and limitations and therefore more apt to make better media choices. To examine the influence of managerial level on media choices in the Air Force, the following research question and hypotheses were addressed (rank and command level were used as surrogate measures of managerial level).

RQ2: Does managerial level explain Air Force members use of communication methods?

H2a: When making media choices for content reasons, high level Air Force managers will conform to MRT more than low level managers.

H2b: When making media choices for situational reasons, high level Air Force managers will conform to MRT more than low level managers.

H2c: When making media choices for symbolic reasons, high level Air Force managers will conform to MRT more than low level managers.

Perceptions and Media Choices

The third research question deals with *perceptions* of media richness as opposed to objective determination of media richness. If a person *perceives* e–mail as being suitable for highly ambiguous situations, he or she might choose a medium that is inappropriate in certain situations.

Schmitz and Fulk (1991) studied the effects of *perceived* media richness from colleagues on the uses and assessments of electronic mail in a large organization. They obtained richness perceptions of *six* media. Three of the media were written forms and therefore user perceptions were aggregated here for clarification. E–mail received a ranking lower than they expected. These rankings follow in Table 1.

Table 1. Scored Richness Ranking (N = 511)

MEDIA	RICHNESS
Face–to–face	4.4
Telephone	3.8
Electronic Mail	3.5
Written	3.1

They found that individual perceptions of media richness influenced media selection.

If Air Force members perceive media to be more or less rich than the theory suggests, their media choices may also differ from those MRT predicts. For example, if managers perceive e–mail as a richer medium than it really is, they may inappropriately choose to use it for tasks that are equivocal (Markus, 1994: 506).

Valacich et al. suggest that a new characteristic be added to the Media Richness Theory — concurrency. By concurrency they mean the ability to support distinct communication episodes without detracting from other episodes that might be going on at the same time. For example, there can be purely serial concurrency or purely parallel concurrency. Verbal has serial concurrency because only one person can speak at a time. Parallel concurrency occurs when ideas can be presented simultaneously. Valacich et al. argue that factors such as power, status (which can be related to managerial level), and *perceptions* of richness influence the use of concurrency in organizational settings.

Only two studies to date on media rankings, consider media richness perceptions. Most studies treat media richness as an invariant objective feature without taking into consideration thoughts or perceptions about that media (Schmitz and Fulk, 1991: 490). The next research question and hypothesis focus on perceptions of media capabilities.

RQ3: Do Air Force members' perceptions of richness for various media concur with those suggested by MRT?

H3: Air Force members will perceive face–to–face as the richest medium, telephone as the next richest, e–mail next, and written as the least rich medium.

Reactions to Media Choices

Previous research on MRT has failed to consider employee's reactions to media choices. When someone is responding to a message, their reactions may be influenced by characteristics of the media used and also the content of the original message. A tragic example of this principle was seen when the Challenger space shuttle exploded with astronauts on board in January of 1986. The decision to launch the shuttle, despite

engineers' misgivings, was made via teleconference. Since the teleconferencing medium is not well suited to communicating intuitive feelings or the strength of emotions, it has been suggested that using this medium could have played a role in the disaster (Trevino et. al., 1987). Use of another medium might have changed the decision.

Similarly, there has been very little research on how using an informal medium such as e–mail instead of more formal printed documents, would impact responses to a survey. Employees may be more apt to respond to written communication than e–mail because written communication is perceived as more directive in nature. Thus, it is hypothesized that Air Force members will be more likely to respond to written surveys than surveys sent via e–mail.

One study did investigate a related issue. Mehta and Sivadas (1995) found a lower response rate for e–mail than for regular mail (40% vs. 45%) in a sample of Internet Newsgroup subscribers. Their expectation that people are sensitive about their e–mail accounts because they sometimes have to pay for the time "on–line" did not receive much support. Due to the nature of written versus e–mail communication in the military, the following hypothesis is proposed:

H4: Air Force members will have higher survey response rates for regular mail surveys than they will for e–mail surveys.

Implications of Media Choices

Consistent with MRT, studies have found that e–mail is less effective in situations involving high equivocality. D'Ambra and Rice (1994) assessed levels of equivocality in certain situations and what media was chosen for those tasks. Initially, they found face–

to–face, telephone, and memos to be the most preferred for dealing with equivocal situations. Letters, e–mail, documents, and going through a secretary to relay a message were the least preferred. In a second survey, five months later, they reported similar findings except voice–mail was ranked third instead of memos. E–mail, letters, and notes were still the least preferred (D'Ambra and Rice, 1994: 233–234). They speculated that voice–mail may have received a higher ranking because of its oral tones and cues and its capability for asynchronous and group message processing. On the other hand, voice–mail was not ranked high enough to be preferred in cases of *high* equivocality, supporting MRT.

Since managers spend a good portion of their time making decisions (Kiesler and Sproull, 1992: 96–123), some other studies have focused on the role of media in that process (Kiesler and Sproull, 1992; McGuire et al., 1987; Valacich et al., 1993; Jones et al., 1994). Compared with face–to–face meetings, these studies found electronic communication media leads to more delays; more explicit and outspoken advocacy; "flaming" (defined as rude, impulsive behavior and the expression of extreme views on the networks); more equal participation among group members; and more extreme, unconventional, or risky decisions (Kiesler and Sproull, 1992: 96, 110). Face–to–face meetings were found more appropriate for decisions involving ill–defined problems, subtle multi–party negotiations, and complex thinking (Kiesler and Sproull, 1992: 118). Face–to–face discussion has also been found to produce more frequent, full, and novel arguments (McGuire et al., 1987: 925) which may lead to more effective decisions and more effective management.

Authors suggest that communication via electronic networks might become more impulsive and extreme because there are not as many social context cues as there would be in a face–to–face meeting such as hesitation, nodding, and frowning (Kiesler and Sproull, 1992: 102; McGuire et al., 1987: 919). The lack of these cues may make the communicator feel distant from others and almost anonymous. Verbal and face–to–face groups are more focused on their "public selves" than electronic and distributed groups (Valacich et al., 1993: 266).

On the other hand, electronic media have some positive effects. "Electronic communication also helps people cross social and psychological barriers (Kiesler and Sproull, 1992: 102)." Race, age, social importance, job title, and organizational level are usually masked from the address line in an electronic mail message. E–mail has been termed an 'equalizer' because it ignores status (Adams et al., 1993: 12). It is possible that people forget that their message will be read, or forget who will read it (Zuboff, 1988). This may be riskier in some organizations than others. In a military organization, it is often crucial to recognize who the recipient of a message will be. Traditional rules concerning rank structure may be ignored if e–mail does make status less important.

Additionally, Valacich et al. (1993) found that groups involved in decision making via electronic communication outperformed those using verbal communication. The groups using electronic media generated more high quality and unique ideas. They were also more satisfied with the process than those involved in verbal communication. Groups that used electronic communication for low–ambiguity tasks outperformed those using verbal, richer communication for the low–ambiguity tasks. This supports the claim that better

decision–making and more satisfied decision–makers results from more effective media choices.

Summary

In order for effective and satisfying work to take place, researchers argue that there needs to be an appropriate fit between the task and communications technology. Technologies are not equally useful for all types of work (Gutek, 1990). To use technologies such as e–mail effectively and make predictions about their consequences, we need to understand factors that influence Air Force managers' media choices and their perceptions about the media involved in those choices. This study may also provide evidence for the relationship between media choices and manager effectiveness.

Chapter 3

Methodology

Procedure

Like Markus (1994), I used a field study to examine subjects' conformance with Media Richness Theory and their perceptions of media richness. The sample consisted of 299 Air Force members worldwide. Survey recipients were randomly selected and given approximately 2 1/2 weeks to complete the survey.

The Instrument

The survey used for this study (See Appendix A) had four parts. The first part was designed to obtain demographic data about the participants and individual differences that might affect media choice and richness perceptions. This section included questions on rank and command level that were used to test hypotheses two and three.

The second portion of the survey asked participants to choose the medium they would use in scenarios highlighting one of the three reason categories (content reasons, symbolic reasons, and situational reasons) described by Markus (1994). There were six scenarios for each category. Each scenario was adapted from Markus (1994) to depict a typical Air Force communications situation. A faculty advisor and four graduate students reviewed the adapted scenarios, made suggestions, and ensured that they were comparable

to the scenarios presented in Markus (1994). This process resulted in 18 scenarios in which respondents were to choose the media they would use. Recipients were to choose the most appropriate media for the task, in their opinion, from the following choices: face–to–face, telephone, electronic mail, and written communication.

The third section of the survey was developed to obtain users' perceptions of media richness. For each type of medium, respondents were asked how much the media helps them understand each other, how much the media impedes communication, and whether or not the media makes conversation easy. If a medium is perceived as helping people understand each other, does not impede communication, and makes conversation easy, than it is considered relatively rich. A 5–item Likert scale was used for these perceptions which prompted respondents to agree or disagree with the statements about each medium. Numerical scores were then obtained to reflect the degree of attitude favorableness of the response. The assumption was then made that attitude favorableness of the statements related to how rich the media is perceived. Cronbach's alpha was used to estimate reliability of the Likert scale portion of the survey — a value of .67 was reported.

Sample

The sample was obtained from a World Wide Transportation directory that included rank, name, office symbol, and e–mail address. This directory consists of Air Force personnel at CONUS and overseas locations and includes Air Force personnel of all ranks. Non–Air Force personnel and civilian employees were excluded. Of those remaining, every other name was chosen for the regular mail group and then every other name of those left was chosen for the e–mail group. Regular mail addresses, which were not in the

World Wide Transportation Directory, were obtained from another source. After invalid addresses were removed from the list, 157 e–mail surveys and 142 regular mail surveys were distributed.

Out of the total 299 surveys sent out, 178 were returned with a response, yielding a response rate of 60%. Of the 178 valid responses, 106 were regular mail responses and 72 were e–mail responses. The response rate for regular mail was 75% and the response rate for e–mail was 46%.

A subset of the data was chosen to examine whether or not the distribution method (regular or electronic mail), biased the responses to the survey. The p– values were all > .05 which provides no evidence that the groups responses differed. In other words, whether regular mail or e–mail was used did not change the response.

Analysis

To mirror Markus' (1994) study, research question one and its associated hypotheses were dealt with using percentages. A table was created indicating how many respondents chose the media MRT would say is most appropriate for the given scenario. The percentage of overall conformance with theory was obtained for content reasons, symbolic reasons, and situational reasons. Then an overall conformance percentage was calculated. Analysis of variance (ANOVA) was used for research question two and its associated hypotheses. With ANOVA, identifying the amount of variance explained by the variables rank and command level was possible. Research question 3 was approached using item analysis of the Likert scale. This determined the attitude favorableness and therefore

perceived richness of the media. Once perceived richness scores were obtained, a one–way analysis of variance was used to examine the difference in those perceptions.

Chapter 4

Results

Demographic Results

Of the 178 respondents, 85% were male and 15% were female. Enlisted ranks made up 41% of the respondents while the rest were made up of officers — 21% company grade and 38% field grade. 56% of those respondents came from either Headquarters United States Air Force, a Numbered Air Force, or a Major Command and 44% came from either Base or Wing level, Squadron level, or lower. Finally, only 5% had less than one year of experience with e–mail, 69% had 1–5 years of experience, and 26% had more than five years of experience with e–mail.

Research Results

The first objective was to find out if MRT explains Air Force members' choices of communication media. Each scenario listed on the survey was associated with each of the content, symbolic, and situational reasons Markus cited, for choosing certain media. The following table lists percentages of how often the managers' choices matched MRT predictions. By looking at what MRT lists as the most appropriate media for each scenario, percentages of agreement with MRT were calculated in each of the three reason categories (see Tables 2 and 3 below).

Table 2. Percent Conformance With Media Richness Theory

REASONS (associated survey question)	**MRT predict**	**agree with MRT**		**media**	**choice**	
CONTENT REASONS			**face**	**phone**	**e–mail**	**written**
To convey, confidential, private, or delicate information (Q10)	face or phone	91%	86%	5%	7%	2%
To describe a complicated situation or proposal (Q16)	face or phone	77	73	4	12	11
To influence, persuade, or sell an idea (Q12)	face or phone	8	6	2	38	54
To express feelings or emotions (Q19)	face or phone	97	95	2	0	3
To keep someone informed (Q9a,b,c)	e–mail or written	79	18	3	75	4
To follow–up earlier communication (Q15b)	e–mail or written	52	34	14	51	1

SITUATIONAL REASONS			**face**	**phone**	**e–mail**	**written**
To respond to a straightforward phone message (Q21)	phone or e–mail	94	5	55	39	0
To respond to a complicated e–mail message (Q13)	phone or e–mail	82	5	7	75	13
To communicate something of little importance to someone close by (Q7)	face	92	92	0	7	0
To communicate something complicated to someone far away (Q20)	phone	37	3	37	49	11
To use the communication medium you prefer best (Q23)	face or phone	57	48	9	43	0
To communicate the same thing to many people (Q15)	e–mail or written	95	3	2	59	36

Table 2 (cont). Percent Conformance With Media Richness Theory

SYMBOLIC REASONS			**face**	**phone**	**e–mail**	**written**
When you want to be casual, informal (Q22)	face	16	16	79	5	0
When you want to convey urgency (Q14)	face or phone	57	39	18	35	8
When you want to convey personal concern or interest (Q8)	face or phone	57	43	14	41	2
When you want to obtain an immediate response, action (Q18)	face or phone	98	66	32	0	1
When you want to show authority, status, position (Q17)	e–mail or written	20	80	0	1	19
When you want to show that your communication is official (Q11)	e–mail or written	98	2	0	46	52

Table 3. Overall Conformance Percentages

Average conformance for Content Reasons	68%
Average conformance for Situational Reasons	76%
Average conformance for Symbolic Reasons	58%
Overall conformance	67%

Overall, Air Force members' media choices conformed with MRT 67% of the time. Their agreement was somewhat higher for situational reasons and lower for symbolic reasons. When situational determinants such as time and place were part of the scenario, members chose the media that conformed with the theory 76% of the time. When content–related determinants such as reducing equivocality were involved, they conformed with the theory 68% of the time. Their responses agreed less (58%) for scenarios involving symbolic determinants such as conveying authority. Overall, Air Force members

made media choices that agreed with what MRT would suggest. Content, situational, and symbolic reasons seem to influence what media is chosen.

These results indicate MRT is useful for predicting the media choices of Air Force managers. Managers in the civilian organization that Markus (1994) studied had an overall agreement percentage that was slightly higher than Air Force managers (6%).

The next objective was to find out if managerial level explained Air Force members use of communication media. Rank and command level were each used as a measure of managerial level. Rank was divided into three categories: enlisted (Airman through Chief Master Sergeant), company grade officers (Second Lieutenant, First Lieutenant, and Captain), and field grade officers (Major, Lieutenant Colonel, and Colonel). Command level was split into two categories. The first category consisted of respondents employed at HQ USAF, a Numbered AF, or a MAJCOM. The second category was made up of those employed at Base or Wing level, Squadron level, or lower.

One–way analysis of variance showed that rank ($p=.24$) and command level ($p=.44$) did not have a significant influence on media choices overall. However, when the scenarios were divided into those that had content determinants, those that had situational determinants, and those that had symbolic determinants, there were different results. When looking only at content–oriented scenarios, the percentages of media choices that were in agreement with MRT were higher for those at the higher command level than for those at the lower command level ($p=.03$). This indicates that those at higher managerial levels did make media choices that matched the theory better, when content reasons were involved. When scenarios involving situational reasons were presented, neither rank or command level influenced media choices. However, when symbolic determinants were

present, both rank (p=.00) and command level (p=.04) *did* significantly influence media choices. Contrary to the direction that was expected however, the higher the rank and command level of the individual, the *less* they conformed with MRT's predictions about media choices for symbolic reasons.

Since there were more than two rank categories, a Tukey HSD test was done to pinpoint which rank categories were significant. The significant difference was between enlisted and field grade officers. Enlisted individuals' choices conformed with the theory significantly more often than field grade officers' choices.

These results suggest that individuals at lower managerial levels, as compared to those at high managerial levels, choose media that MRT would say is more appropriate, when symbolic determinants such as conveying authority or involved. This contradicts the notion in MRT that higher–level managers are more "media–sensitive". The dichotomy between higher conformance at higher managerial levels for content reasons and opposite findings for symbolic reasons is an interesting contrast that could be further examined.

Discovering if Air Force members perceive richness of media in the way MRT would suggest was another objective of this study. A 5–point Likert scale was used to measure how favorable or unfavorable the attitudes were toward statements indicating the inherent richness of the media. Higher scores indicated that respondents perceived the media to be rich. These numerical scores were used to order the media in terms of richness, as perceived by the participants in this study. The richness of the media was ranked somewhat differently than what MRT suggests or what Markus found (Markus, 1994: 517–518). The richness perceptions obtained for this study are shown in Table 4.

Table 4. Ranking of Air Force Richness Perceptions (N=178)

MEDIA	RICHNESS SCORE
Face–to–face	4.2
Telephone	3.8
E–mail	3.8
Written	3.5

A one–way ANOVA showed a significant difference in the perceptions of the media (p=.00). A Tukey HSD test was then conducted to pinpoint where the differences were. There was a significant difference between face–to–face communication and the rest of the media. There was also a significant difference between written methods and other media. On the other hand, E–mail and telephone had no significant difference.

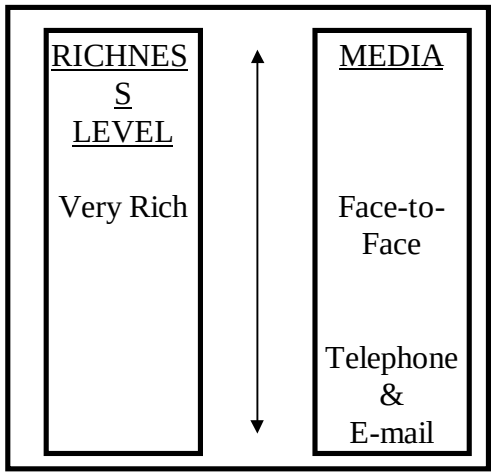

Figure 2. Relative Levels of Perceived Richness

These results indicate that although face–to–face and written media were still perceived to be the most and least rich, respectively, Air Force members perceive e–mail as just as rich as telephone.

The final objective of this study was to compare response rates for regular mail and e–mail surveys. For this sample, the response rate for regular mail was 75% and the

response rate for e–mail was 46%. The expectation that the response rate for regular mail would be greater was based on a previous study (Mehta and Sivadas, 1995). The magnitude of difference between regular mail and e–mail in this research (29%) was much greater than that found in the previous study (5%). Air Force members were expected to perceive written communication as more formal and task–oriented. The response rates are shown in Table 5 below:

Table 5. Response Rates for Regular and Electronic Mail

MEDIUM	NUMBER SENT	NO. RETURNED	RESPONSE RATE
Regular Mail	142	106	75%
Electronic Mail	157	72	46%
TOTAL	299	178	60%

The following table summarizes the results of this study.

Table 6. Hypotheses Results

NO.	STATED HYPOTHESIS	SUPPORTED OR NOT
H1a	When scenarios are presented that involve content determinants, Air Force members will select media that meet MRT criteria.	Supported
H1b	When scenarios are presented that involve situational determinants, Air Force members will select media that meet MRT criteria.	Supported
H1c	When scenarios are presented that involve symbolic determinants, Air Force members will select media that meet MRT criteria.	Supported
H2a	When making media choices for content reasons, high level Air Force managers will conform to MRT more than low level managers.	Partially Supported
H2b	When making media choices for situational reasons, high level Air Force managers will conform to MRT more than low level managers.	Not Supported
H2c	When making media choices for symbolic reasons, high level Air Force managers will conform to MRT more than low level managers.	Not Supported
H3	Air Force members will perceive face–to–face as the richest medium, telephone as the next richest, e–mail next, and written as the least rich medium.	Partially Supported
H4	Air Force members will have higher survey response rates for regular mail surveys than they will for e–mail surveys.	Supported

Summary

According to MRT, Air Force members make effective media choices 67% of the time. Rank and command level do not influence these choices unless symbolic determinants are present. When they *are* present, individuals at lower managerial levels make more effective media choices, according to MRT. In addition, Air Force members perceive face–to–face as the richest medium, telephone and e–mail as the next richest, and they perceive written communication to be the least rich. Finally, more Air Force members responded to a written survey than to an e–mailed survey. These results give

implications about media use and can give guidance toward creating policy for newer media such as e–mail.

Chapter 5

Discussion and Conclusions

Discussion

The Air Force and Conformance with MRT

MRT *does* explain Air Force members' choices of communication media. Markus' scale is an effective tool for determining media choice behavior. Air Force members had a high conformance with MRT based on the scale.

A closer look at our results using Markus' scale (Table 2) does however show that some percentages were significantly lower than the rest within each category (content reasons, situational reasons, symbolic reasons). For example, in the content reasons category, Air Force members most often chose e–mail or written communication "To influence, persuade, or sell an idea." MRT would suggest face–to–face or telephone media for this type of scenario. Since the military emphasizes a formal documentation process, it is not surprising that Air Force members see written communication as the most persuasive. The scenario used to represent selling an idea was that the individual wants to convey to others a way of saving the Air Force thousands of dollars. It may have reminded participants of the Air Force suggestion program that requires written input. Another item with low percentage of conformance in the content reasons category (52%),

involved the purpose, "To follow–up earlier communication." First of all, the medium used for the "earlier communication" may effect the medium used for the response. Research should examine this effect. The scenario presented was, "You want to tell your supervisor you found an answer to a question he/she had." Only 1% of Air Force members chose written media which was one of the two media suggested by MRT. Responses may have been influenced by the fact that the message was going to the *supervisor*. Respondents of the survey may have less formal relationships with their immediate supervisors and therefore may choose more personal media. They also may see proximity as a factor — people tend to be physically located close to their supervisor. Why waste time with written communication if they asked for an answer to a question and are located only two doors down the hall? Further research should address how the recipient of the message effects the media used. Comparisons of messages to the supervisor, messages to the co–worker, and messages to the subordinate should be analyzed.

In reference to the situational reasons category of scenarios, Markus suggested that in accordance with MRT, the telephone should be used "To communicate something complicated to someone far away." Most Air Force members chose e–mail for this scenario which seems to include content as well as situational determinants since the message involves equivocality reduction. This can be explained by the fact that respondents ranked e–mail just as rich as telephone communication. Also, outdated and poor quality telephone systems may explain why respondents did not perceive telephone media to be as rich as MRT would suggest.

When symbolic determinants were involved, two scenarios produced significantly lower results. Instead of choosing face–to–face communication "When you want to be casual or informal" as MRT would suggest, 79% of the respondents chose the telephone. Everyone in the military wears a uniform which clearly displays the individual's rank. For higher ranking individuals, trying to be casual or informal may be impossible when wearing your rank on your sleeve. Additionally, for lower ranking individuals, trying to be casual or informal may not be the norm and would probably make the individual uncomfortable in a face–to–face situation. This same reasoning could also help explain why most respondents chose face–to–face media "When you want to show authority, status, or position" instead of e–mail or written media. Respondents may have interpreted these scenarios differently than expected.

Without those few scenarios, the overall agreement with the theory becomes 83%, 16% higher than if they are left in. For content reasons, agreement becomes 86%; for situational reasons, agreement becomes 84%; and for symbolic reasons, agreement becomes 78%. Thus, results might have supported the scale and MRT even more with modified scale items.

When using this model it is important to consider the *context* in which it is being used and what other factors may influence the results. This analysis has shown that the model may require revisions for certain settings. However, the results do seem to support the usefulness of the model and MRT.

Managerial Level and Conformance with MRT

Managerial level operationalized as rank and command level, does not explain Air Force members use of communication media. *Overall* managerial level did not influence

media choices. The results did support MRT for content reasons — higher ranking individuals had higher conformance percentages. There is an interesting difference between these results and those for symbolic reasons. The results indicate that enlisted individuals were more media sensitive and made more effective media choices than field grade officers when *symbolic* determinants were involved. The symbolic determinants involve scenarios such as "When you want to convey urgency," "When you want to obtain an immediate response," and "When you want to show that your communication is official." Individuals at lower levels may simply be more conscious of what media seems more appropriate because the repercussions are worse if they do not use the right media. Higher level individuals have more freedom with what media they choose. For example, they may be less inclined to be worried about coming across as too informal.

Command level also influenced media choices when symbolic determinants were involved. Those at higher command levels (HQ USAF, Numbered AF, and MAJCOM) made less effective media choices according to MRT. However, those at higher command levels have the need to communicate to more people (there are more levels below them) and may tend to use e–mail and the telephone more often as a result. If they use these media in situations where MRT would say other media should be used, they will not score as high in conforming with MRT.

Perceptions and Media Choices

For the most part, Air Force members perceive richness of media the same as MRT would suggest. Air Force members *do* perceive face–to–face as the richest medium and written as the leanest but do not perceive a difference in richness for telephone and e–mail. Since Markus' study was done two years ago, it is possible that as e–mail has become

more pervasive, people are using it more often and therefore may be finding better ways to counter its lean capacity. If people constantly have their e–mail system running and check messages as they come in, the opportunity for feedback becomes much greater. People have also discovered formatting techniques such as using capital letters and smileys (a sideways smiley is made by typing a colon, a hyphen, and the right side of parentheses i.e., :–)) to convey emotions. There are even smiley dictionaries available to show how to use the keyboard to create faces that convey frustration, confusion, or sarcasm. Further research might include a longitudinal study to see how media perceptions change as individuals adapt to newer media.

Suggestions for Future Research

Further research in the area of MRT may conclude that there are more than just content, situational, and symbolic determinants involved. Expansion of MRT could also include what additional factors may determine the richness of a medium especially with the recent inception of newer media. Markus suggests that if e–mail features such as multiple addressability and electronic recording capability are factored in, e–mail would be placed much higher on the richness scale.

Additionally, this study did not examine whether or not rank or command level affected richness perception rankings; only perception rankings across all Air Force personnel were analyzed. If field grade officers perceive the richness of media differently than enlisted personnel, their media choices will also be different. This might help explain why lower level individuals agreed with MRT more often. Along the same lines, it would be important to find out if higher level managers chose richer media more often than lower

level managers, as it has been proposed that they are faced with more equivocal situations such as conflict resolution. For example, electronic mail systems seem to be more readily used for lower level operations rather than higher level decision making (Munro and Wheeler, 1980: 28). Finally, although this study lends support to MRT, examining MRT in other contexts may expand the scope of the theory as well as strengthen support for it.

Conclusions

Implications for E–mail Use and Policy

Ambiguity of a message, time and place of a message, and conveying authority in a message can all influence what medium is chosen for that message — content reasons, situational reasons, and symbolic reasons all influence Air Force managers' media choices. With the inception of new media such as electronic mail, influences on media choices need to be understood to get a better understanding of whether or not these new media are being used effectively. Air Force managers seem to be making appropriate and effective media choices and richness perceptions influence these media choices. The perceived richness of e–mail may increase as users learn new techniques and conventions for using it on a routine basis. Media Richness Theory can be used as an effective tool in predicting media choice behavior. Further research may be needed to discover what other factors effect media choices, which factors have the most influence, and what it means for the Air Force. In the mean time, this study can help policy–makers make predictions about what media choices will be made by Air Force managers in order for them to be the most effective.

Appendix A

Communications Media Survey

SURVEY ON COMMUNICATIONS MEDIA

The following is a short, simple survey that will help gather important information regarding the use of communications media in the Air Force. It was designed as part of a research project by a student at the Air Force Institute of Technology. All answers will be anonymous.

PART I: Please fill out some general demographic information by circling one of the selections listed:

1. What is your sex?

A. Male B. Female

2. What is your rank?

A. E–1 thru E–5 B. E–6 thru E–9 C. O–1 thru O–3 D. O–4 thru O–6
E. General Officer

3. How many years have you been in the Air Force?

A. Less than 2 B. 2 – 6 yrs. C. 7 – 12 yrs. D. 13 – 18 yrs.
E. More than 18 yrs.

4. What is your education level?

A. High School
B. Some Undergraduate work
C. Undergraduate Complete
E. Masters Degree Complete
F. Some PhD work
G. PhD complete

D. Some Masters

5. At what command level do you work?

A. HQ USAF B. Numbered AF C. MAJCOM D. Base/Wing level
E. Squadron level or lower F. Other_____

6. How long have you been using electronic mail?

A. 0 – 1 year B. 1 – 2 yrs. C. 2 – 3 yrs. D. 3 – 5 yrs.
E. Over 5 yrs.

PART II: For the next set of questions please choose <u>one and only one</u> medium you would use – face–to–face, telephone, e–mail, or written communication for each scenario. Choose A–D according to the following scale and write it next to the question:

A = Face–to–face communication
B = Telephone communication
C = E–mail communication
D = Written communication

7. You want to tell the person in the next office there is no coffee left._____

8. You want to tell a co–worker you'd like to see the results of a project he/she is working on because the area is of interest to you._____

9. You want to pass on some FYI information to (provide one medium for each):

   a. your co–worker_____

   b. your boss_____

   c. your subordinate_____

10. You want to tell your supervisor one of your subordinates just received an Article 15. _____

11. You are sending a required report on how your squadron has met some quality initiatives._____

12. You want to inform others of an idea you have that could save the Air Force thousands of dollars._____

13. You want to respond to a long e–mail message describing some complicated issues you have been asked to take care of._____

14. You are asking a subordinate to get a document to the MAJCOM or higher level Commander as soon as possible._____

15. You want to tell the whole squadron there will be a mass weigh–in coming up._____

16. You want to explain to someone how to do a certain aspect of your job they will be taking over._____

15b. You want to tell your supervisor you found an answer to a question she/he had._____

A = Face–to–face communication
B = Telephone communication
C = E–mail communication
D = Written communication

17. A subordinate is not following orders and you want to let them know so._____

18. You are telling a subordinate they need to see your boss right away._____

19. You want to tell a subordinate you are sorry his/her father died._____

20. You want to tell a counterpart at another MAJCOM how to perform a complicated aspect of your job._____

21. You are responding to a telephone message from a co–worker stating a report is due Wednesday and you want to let him/her know you have almost completed it._____

22. You want to ask a friend if he/she can meet you at the Club after work._____

23. In general, which one method of communication do you most prefer?_____

PART III: Please answer the following questions by circling a number on the scale below each question:

24. Face–to–face communication helps me and others understand each other.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

25. Face–to–face communication hinders my communications with others.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

26. Face–to–face communication makes interacting with others easy.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

27. Telephone communication helps me and others understand each other.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

28. Telephone communication hinders my communications with others.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

29. Telephone communication makes interacting with others easy.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

30. E–mail communication helps me and others understand each other.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

31. E–mail communication hinders my communications with others.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

32. E–mail communication makes interacting with others easy.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

33. Written communication helps me and others understand each other.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

34. Written communication hinders my communications with others.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

35. Written communication makes interacting with others easy.

1	2	3	4	5
strongly disagree	disagree	neutral	agree	strongly agree

PART IV: Please answer the following questions with your own opinions and/or comments:

36. What do you see is the greatest advantage of e–mail?

37. What do you see is the greatest disadvantage of e–mail?

38. In an average week, how many total hours do you spend on e–mail (i.e. checking, reviewing, and sending e–mail.)?

39. Have you ever had any major problems concerning e–mail? If so, please describe:

Thank you very much for taking the time to complete this survey. Your inputs are greatly appreciated and will be beneficial for understanding how people use different communication media in the Air Force. If you have any questions or comments please respond to Capt Heather Adams, AFIT/LAA, Wright–Patterson AFB OH, DSN 785–7777 x2223, hadams@afit.af.mil.

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