

The complexity of richness: Media, message, and communication outcomes

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Abstract:

Dynamic web-based multimedia communication has been increasingly used in organizations, necessitating a better understanding of how it affects their outcomes. We investigated factor structures and relationships involving media and information richness and communication outcomes using an experimental design. We found that these multimedia contexts were best explained by models with multiple fine-grained constructs rather than those based on one- or two-dimensions. Also, media richness theory poorly predicted relationships involving these constructs.

Keywords: Media richness theory; Information richness; Communication theory

Article:

1. Introduction

Investigation of relationships between the media and communication effectiveness has not provided consistent results. However, lack of understanding has not deterred organizations from investing heavily in new and dynamic forms of web-based multimedia for their marketing, public relations, training, and recruiting activities. Few studies have examined the effects of media channels and informational content on decision-making and other organizational outcomes. We decided therefore to examine the relationships between media channels, user perception of the communication process, and outcomes.

Much of the current research has been grounded in media richness theory (MRT), which posited that various types of media differ in their capacity to convey messages and cues [5,6]. Its central hypothesis is that communication effectiveness depends on the match between task requirements and medium capacity. With few exceptions, IS research has not empirically examined this: studies have investigated the perceptions of media fit rather than the actual performance [7]. Research exploring social influences on communication also tended to examine media choice rather than its effectiveness, with some exceptions [e.g., 27]. Thus, we need to learn about the effectiveness of the media [25].

There is some confusion because Daft and Lengel discussed two types of richness: media richness, defined as a medium's "capacity to process rich information," and information richness—the ability of a message "to change understanding within a time interval." Our study had two objectives, to:

1. examine the factor structure of the richness construct [To what extent are media richness features and communication outcomes associated with media type?] and
2. understand the nature of the relationships between media, communication outcomes, and richness [To what extent are communication outcomes associated with media richness features?].

2. Theory development and hypotheses

Communication effectiveness depends on the features of the communication as well as the receiver's ability [19]. Cues such as verbal tones, facial expressions, body language, dress, appearance, and settings, convey

important information about the sender's power status and credibility and "create or elicit cognitive interpretations and concomitant emotional states" [24]. Face-to-face meetings can convey trust and goodwill, irrespective of the message [10]. Media that cannot convey important social cues have been tied to higher levels of perceived conflict between communication participants [16]. However, sometimes it is better to reduce or eliminate social cues (e.g., in idea generation across hierarchies).

Satisfaction has been defined in terms of a receiver's affective reactions [11]. Satisfaction with a communication is difficult to separate from satisfaction with the contained message. This problem can be solved by using several types of media and different messages in a crossed design. Our research used this approach.

2.1. Media richness

MRT states that communication consists of a variety of cues that convey both information and help a receiver resolve ambiguity and uncertainty by providing a social, emotional, or task-related context. There are, however, questions about the dimensionality of the richness construct; that is, does it exhibit a one-factor, a two-factor (e.g., media richness and information richness), or multiple-factor structure? We examined several factors.

Symbols are powerful communication tools [3]. Symbolism supports organizational communication by conveying intangible elements of the firm's culture, norms, and values. Media differ in their ability to convey symbols and symbolic content. As a result, media differ in their ability to convey norms, value-oriented information, and the implicit understanding of the cultural features of an organization [23]. Media also differ in the multiplicity of cues they convey (such as in tone of voice or physical gestures) [15].

Media also relays the communicators' social presence, i.e., humanness, sociability, personalness, and warmth [22]. While originally developed for synchronous bi-directional communication, it has also been used to study asynchronous communication [20] to create or elicit personal feelings and emotions that give a message a personal focus which enhances communication effectiveness by increasing the relevance of the message and the receiver's involvement.

The amount of information affects communication outcomes by reducing uncertainty. The appropriate amount is determined by the purpose of communication and the message content. If the medium's capacity is less than that required, some of the information cannot be transmitted and the communication will be less effective. Richer media can transmit a wider range of cues but too many cues may induce information overload. Information overload can also occur when information is unfamiliar, complex, or is presented more rapidly than the receiver can process. Research has shown that comprehension of "easy" messages is equivalent across text, audio, and video media but understanding "difficult" messages is better for text [4].

2.2. Hypotheses

If media matters, then the various media types must differ in ways they support specific types of communication. Media that have greater bandwidth, faster transmission rates, and more efficient encoding are thought to be "richer" than others. Communication capacities limit the type, quantity, and pacing of communication experienced by the receiver. Therefore, we hypothesized:

Hypothesis 1. Receiver's perceptions of media richness will vary with media type, such that perceptions of media richness will be higher for video than audio and higher for audio than text.

Media richness features are influenced by the nature of the message content. For example, Short, Williams, and Christie suggested that communication exchanges that need participants to develop a personal relationship may elicit more information about the participants as people. In our study, differences in message content were operationalized in terms of the distinction between personally oriented (subjective) and fact-oriented (instrumental) information. Subjective messages often rely on the use of "rich" symbols (e.g., national symbols to represent or inspire pride or patriotism). Instrumental messages rely on "lean" symbols (e.g., numbers describing salary). Thus, we predicted that:

Hypothesis 2. Receiver's perceptions of richness will vary with message characteristics.

Media may also have a direct effect on communication outcomes. Media types possessing greater bandwidth are likely to be better able to convey information content and thus lead to higher levels of communication effectiveness and satisfaction in complex problem contexts. Therefore:

Hypothesis 3A. Receiver's perceptions of communication effectiveness will vary across media type, such that effectiveness will be higher for video than audio and higher for audio than text.

Hypothesis 3B. Receiver's communication satisfaction will vary across media type, such that satisfaction will be higher for video than audio and higher for audio than text.

The message characteristics were expected to influence communication outcomes directly. This relationship had been demonstrated in research on positive versus negative advertising content [12], factual versus emotional content [17], and transformational versus informational message content [21]. Therefore, we predicted that:

Hypothesis 4A. Receiver's perceptions of communication effectiveness will vary across message characteristics.

Hypothesis 4B. Receiver's communication satisfaction will vary across message characteristics.

If groups who use different media report differences in communication effectiveness and satisfaction do not perceive differences in richness, then it will be difficult to explain how receivers perceive media differences or why media matter. Thus:

Hypothesis 5A. Receiver's perceptions of communication effectiveness will vary with richness.

Hypothesis 5B. Receiver's perceptions of communication satisfaction will vary with richness.

These hypotheses and constructs are shown in the research model of Fig. 1, which controls for receiver's characteristics that seemed likely to influence effectiveness and satisfaction. First, participant expertise with message content can affect communication clarity and social perceptions about decision quality and media richness [14]. In addition, a receiver's ability to understand symbols and cues in a message increases as experience with the subject matter grows. Past experience with the subject matter may also influence satisfaction.

While having high levels of control and internal validity, the model does not fully represent the complex and episodic nature of the communication process and it does not incorporate temporal or situational factors. Our research design facilitated the testing of individual-level media and message effects on a large sample population in a controlled situation. This was an important goal, because very little research had examined communication outcomes across different media and message content.

3. Research design and methods

The hypotheses were tested using a 3 x 2 x 2 design varying media type (text, audio, and audio/video), message content (subjective and instrumental), and message length (messages of about 1 and 3 min duration). This design is depicted in Fig. 2.

3.1. Subjects

The sample size was 688 subjects. The average participant was 23 years old. The subject pool was 74% single and 53% male. Fifty-six percent of the sample described themselves as white, 31% as African-American, and 13% as another race. The age and educational backgrounds of these subjects were consistent with the messages used in the study (i.e., officer recruiting advertisements from the study's sponsor, the US Navy); therefore, the

subject matter was appropriate. Subjects were drawn from 30 undergraduate business classes of a mid-sized university in the southeastern United States. They had either taken or were currently taking a course that included coverage of web browsers. Experience using the web was important because perceptions of richness had been shown to be significantly related to past experience with a medium. The investigators made sure that each participant completed the study only once. Subjects received class credit for participation. A few who did not wish to participate were allowed to participate in a different activity.

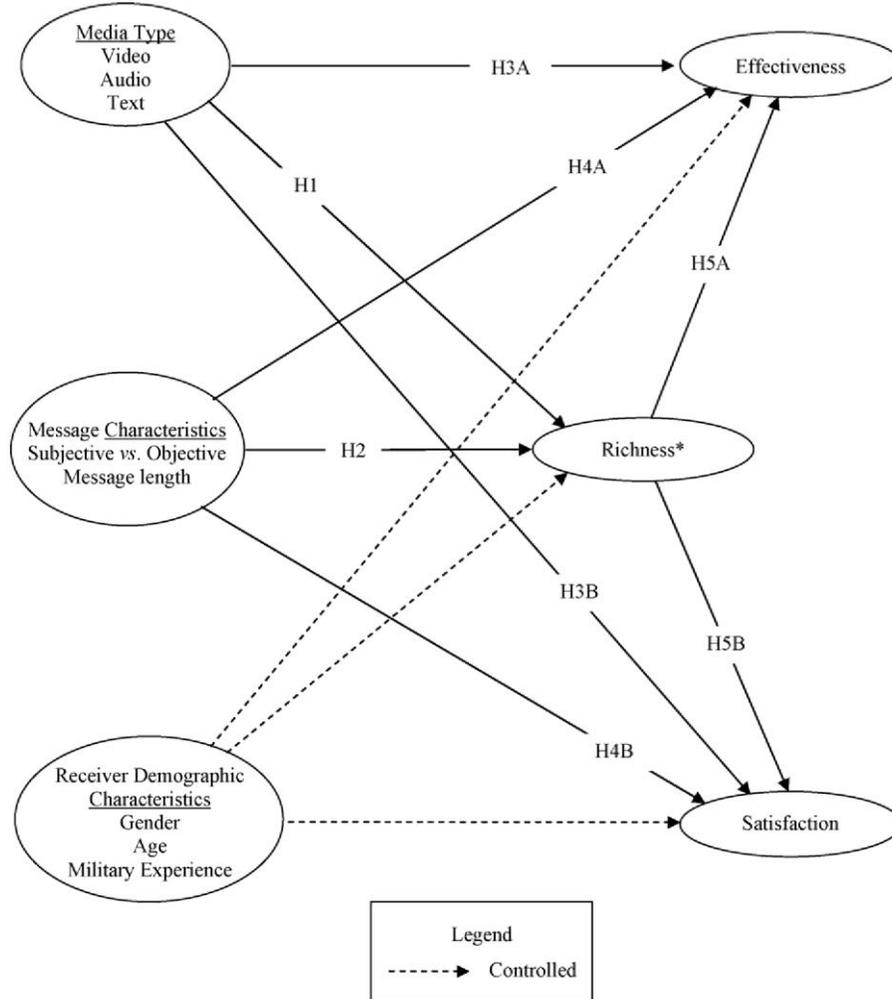


Fig. 1. Research Model. *To be tested for factor structure (i.e., one-, two-, or four-factor construct).

3.2. Treatments

Treatments were constructed from US Navy video recruiting materials directed towards college students. Short episodes were extracted and divided into subjective and instrumental types of messages. Subjective messages addressed personally oriented information, such as: How do Navy careers help sailors grow and mature as people? Instrumental messages gave fact-oriented details, such as pay, vacation, and benefits.

These video treatments were used to construct audio and text messages. While this approach facilitated message consistency across media type, it meant that a message designed for one medium might not adapt well to another.

Message Length	Message Content	Media Type		
		Video	Audio	Text
~3:00 Minutes	Subjective	1	2	3
"	Objective	4	5	6
~1:00 Minute	Subjective	7	8	9
"	Objective	10	11	12

Fig. 2. Experimental design.

Treatment presentations were prepared using Microsoft® Office PowerPoint® to ensure that exactly the same material was presented to all subjects receiving the same treatment. All treatment presentations contained three sets of slides: the first contained pre-recorded video instructions for the subjects; the second, treatment slides; and the third, instructions for completing questionnaires. Video and audio treatments were constructed by pasting a video clip into a PowerPoint® slide, but the two treatment types differed in the way the video clip was inserted. Video treatments had the clip pasted over a large portion of the slide so that the video portion was easily visible. Audio treatments had the video output hidden from view. Text treatments were constructed from transcripts and descriptions of scenes from the video clips.

3.3. Experimental procedure

Students were informed at the beginning of the class that an experiment was to be conducted and that course credit was to be awarded. Subjects were asked to view advertisements for the US Navy. They were told not to pretend they were joining the Navy, but to consider the Navy as a possible career choice. Subjects were asked to answer the questions truthfully. They were specifically told “there are no correct answers, only honest opinions.” They were asked not to discuss their feelings or impressions during or after their participation to avoid biasing the opinions of potential future subjects.

Subjects were then randomly divided and placed in separate treatment rooms. Treatment groups ranged from 20 to 50 participants. Contamination between groups was avoided in two ways: each treatment was conducted in a separate room and subjects who had previously participated were given a different activity to complete. Subjects were shown the pre-recorded instruction and treatment portions of the prepared presentations on a large projection screen.

Subjects in the text treatments were given transcripts in lieu of video or audio treatments and given plenty of time to read them.

After finishing the questionnaire, the subject handed it to the survey coordinator, who then checked that the questionnaire had been completed. Only after the survey was checked were subjects allowed to sign the class roster for participation credit. Total treatment time – including introduction, moving participants to separate rooms, and administering the treatments and surveys – averaged between 45 min and 1 h.

3.4. Pilot study, instruments, and validation

To help ensure content validity, a pool of scale items was drawn or adapted from instruments reported in the literature. Likert scales of five or seven points were adopted. Critical incidents method was used to obtain additional items. These statements were tested for construct validity and instrument reliability in a pilot study. The subject pool for this pilot consisted of undergraduate students from many majors.

Construct validity and instrument reliability were checked via principal axis factor analysis. Items in the pilot that did not support desired dimensions were eliminated. Survey items and their supporting reference citations are shown in the [Appendix A](#).

4. Analysis and results

The analysis was performed in three steps. First, the convergent and discriminant validities of the latent variables were examined. Second, confirmatory factor analyses were conducted and compared among the three models (the one-and two-factor media richness and information richness model; and the four-factor symbolism, social presence, personal focus, and information overload model). Finally, the simultaneous effects of these relationships were tested using SEM. Latent means for media features and communication outcomes were also generated and compared across media type.

Table 1
Descriptive statistics and correlations ($N = 688$)

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
(1) Effectiveness	10.80	2.50												
(2) Satisfaction	10.05	2.58	0.71**											
(3) Symbolism	10.06	2.21	0.41**	0.39**										
(4) Social presence	19.79	4.57	0.40**	0.35**	0.38**									
(5) Personal focus	8.28	2.62	0.43**	0.49**	0.49**	0.43**								
(6) Information overload	2.64	0.82	-0.28**	-0.16**	-0.09**	-0.21**	-0.17**							
(7) Video	0.33	0.47	0.20**	0.34**	0.09**	0.13**	0.12**	-0.02						
(8) Audio	0.31	0.46	-0.18**	-0.23**	-0.13**	-0.06	-0.12**	0.16**	-0.47**					
(9) Text	0.36	0.48	-0.02	-0.11**	0.04	-0.07*	0.00	-0.14**	-0.53**	-0.50**				
(10) Message content ^a	0.47	0.50	-0.05	-0.04	0.02	0.11**	0.13**	-0.14**	0.02	0.03	-0.05			
(11) Age	23.42	4.76	-0.02	-0.07*	0.07*	0.07*	0.03	-0.04	0.00	-0.03	0.02	0.01		
(12) Gender ^b	0.53	0.50	0.01	0.00	0.03	0.09**	-0.02	0.02	0.01	-0.05	0.03	0.01	0.02	
(13) Military experience ^c	0.38	0.49	0.06	0.07*	0.02	0.02	0.04	-0.05	0.04	-0.06	0.01	-0.02	0.18**	-0.01

* $p < 0.05$.

** $p < 0.01$.

^a Subjective content = 0; instrumental/objective content = 1.

^b Female = 0; male = 1.

^c Any military experience, either personal or parental. No experience = 0; any experience = 1.

Results from the correlation analysis are displayed in Table 1. For the purposes of these correlations, media types were coded as dummy (0, 1) variables (i.e., text, audio, and video). The correlations show that each communication outcome and each media richness feature is significantly associated with at least two media type dummy variables at the $p < 0.05$ level.

Table 2
Evidence of reliability and convergent validity ($n = 688$)

Construct	Items	Cronbach's α	Factor reliability
Symbolism	3	0.63	0.48
Social presence	4	0.83	0.63
Personal focus	4	0.74	0.53
Information overload	2	0.71	0.56

The convergent and discriminant validities of the four media richness variables were supported by examination of the correlations among their measurement items [2]. Correlations among items within each media feature were higher than the correlations between items associated with different media features. Results from internal-consistency and convergent validity analyses are displayed in Table 2. All variables exhibited sufficiently high Cronbach's alpha values (above 0.70) except symbolism (0.63). Factor reliabilities were also acceptable for all media features (0.50 or higher), though symbolism's reliability (0.48) was lower. Although lower than desired, these values do not mean that symbolism should be automatically excluded. Indeed, there are several reasons for keeping it. First, symbolism represents an important theoretical component. Second, low reliability is not a problem if symbolism relationships are found to be significant in later analyses. Since its random error is not correlated with the random error of other variables, symbolism cannot generate false positive results. A third reason is that moderate levels of reliability due to measurement error are computed for in SEM [8].

Table 3
Evidence of discriminant validity ($n = 688$)

Competing models	χ^2 ^a	d.f.	RMSEA	ECVI	CFI
1. Freely correlated media features	273.69	50	0.07	0.49	0.96
2. Perfectly uncorrelated media features	770.37	65	0.13	1.20	0.89
3. Perfectly correlated media features	479.24	65	0.10	0.77	0.90

^a Normal theory weighted least squares Chi-square.

The results of additional discriminant validity tests are displayed in Table 3. These show that the goodness of fit between the covariance matrices from the data and the model is worse if the four media features are forced to be perfectly uncorrelated or perfectly correlated. Comparisons of the RMS Error of Approximation (RMSEA), Expected Cross-Validation Index (ECVI), and CFI across the three models suggested that though the four media

feature variables were correlated, they were distinct from one another. These results supported the discriminant validity of the media feature constructs.

Table 4
Confirmatory factor analyses ($n = 688$)

Competing models	χ^2 ^a	d.f.	RMSEA	ECVI	CFI
1. One-factor measurement model (richness)	1580.06	65	0.18	2.38	0.80
2. Two-factor measurement model (media richness and information richness)	1391.27	64	0.17	2.10	0.82
3. Four-factor measurement model (symbolism, social presence, personal focus, and information overload)	273.69	59	0.07	.49	0.96

^a Normal theory weighted least squares Chi-square.

Confirmatory factor analyses were performed on the three first-order models. Results are displayed in Table 4. Goodness of fit statistics indicated that the four-factor first-order model which specified symbolism, social presence, personal focus, and information overload as separate constructs explained the data better than a two-factor model or a single overall dimension of richness. Therefore, media features were used in place of richness, media richness, or information richness constructs in further analyses.

4.1. SEM of media features and communication outcomes

Relationships among media type, media features, control variables, and communication outcomes were examined simultaneously using SEM. Fig. 3 shows the model in a simplified form (control variables and related paths were not included). The R^2 values are the squared multiple correlations from reduced form equations. Reduced form R^2 values were used instead of structural equation R^2 values because the former can be interpreted as measures of explained variance, while the latter cannot [13].

Goodness of fit results from the SEM analysis of the four-factor structural model is displayed in Table 5. The RMSEA, ECVI, and CFI values were acceptable.

Standardized path coefficients for the four-factor structural model are displayed in Table 6. The dummy variable representing audio was significantly related to symbolism ($\gamma = 0.20$, $p < 0.01$), personal focus ($\gamma = 0.17$, $p < 0.01$), social presence ($\gamma = 0.12$, $p < 0.05$), and information overload ($\gamma = 0.13$, $p < 0.05$). The text dummy variable was significantly related to social presence ($\gamma = -0.13$, $p < 0.05$). In total, five out of eight possible relationships of Hypothesis 1 received support. Message content was related to information overload ($\gamma = 0.16$, $p < 0.01$), and social presence ($\gamma = 0.10$, $p < 0.05$). Message length was related to symbolism ($\gamma = 0.12$, $p < 0.05$). Overall, three of eight possible relationships of H2 were supported.

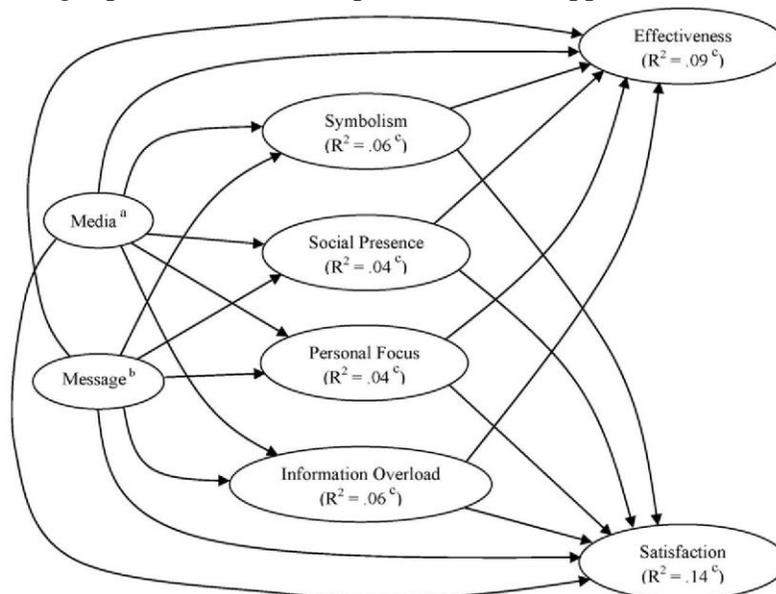


Fig. 3. Simplified overview of four-factor structural model. *Control variables not included diagram, but were included in analysis. ^aMedia represented by audio and text dummy (0, 1) variables in Table 6. ^bMessage represented by content and length dummy (0, 1) variables in Table 6. ^c R^2 values are squared multiple correlations from reduced form equations.

Table 5
Analysis of Four-Factor Structural Model ($n = 688$)

Goodness-of-Fit Statistic	Value
χ^2 ^a	373.25
d.f.	234
RMSEA	0.03
ECVI	0.88
CFI	0.97

^a Normal theory weighted least squares Chi-square.

The standardized path coefficients showed that media type and message content were more strongly associated with communication outcomes than with media richness features. In addition, media type was more strongly associated with satisfaction than with effectiveness. This finding not only supported the contention that satisfaction may have a “spillover” effect on perceived effectiveness, but also appeared to explain results from previous research using self-reported data to associate media richness with communication effectiveness. These results provide at least some support for H3A, H3B, H4A, and H4B.

Seven of the eight paths between media features and communication outcomes were significant at the $p < 0.01$ level. The one exception was information overload \rightarrow satisfaction, which was not significant. The standardized path coefficients show differences in the effects of media features on communication outcomes. Symbolism and personal focus were moderately associated with effectiveness and satisfaction, ranging from 0.34 (symbolism \rightarrow satisfaction) to 0.47 (personal focus \rightarrow satisfaction).

Social presence was also associated with effectiveness and satisfaction (i.e., 0.29 and 0.22, respectively). As expected, information overload had a significant negative association with effectiveness (i.e., -0.28), though the finding that it was not significantly associated with satisfaction (i.e., -0.12) was a surprise for us. Overall, these results supported H5A and H5B.

R^2 values were used to measure the amount of variance in media richness features and communication outcomes accounted for by media type, demographic variables, and message content and length. The R^2 values for effectiveness and satisfaction were 0.09 and 0.14, respectively. The R^2 values for media features were about half the values.

Associations between media type and the latent means of effectiveness, satisfaction, symbolism, social presence, personal focus, and information overload were also examined (Fig. 4). These were represented by 95% confidence intervals displayed across media type. The graphs in Fig. 4a–b show the effects of media type on communication outcomes. These results are different from those predicted by MRT. Video was rated as the most satisfactory of the three media, yet text was rated as having the highest effectiveness. These results supported Hypothesis 3B but not 3A. The finding that text media was rated as more effective than video media suggested the original message content, though crafted for the video medium, could be transported to other media.

The graphs in Fig. 4c–f show that the effects of media type on richness features were different from those predicted by MRT in three out of four cases. Only information overload conformed to MRT predictions. Audio produced the highest levels of symbolism, while text produced the highest levels of social presence. Video and text had greater but roughly equal effects on personal focus than audio. These results did not support Hypothesis 1.

Table 6
Standardized path coefficients from SEM analysis ($n = 688$)

H^a	Path	SPC ^b	H^a	Path	SPC ^b
1	Audio → symbolism	-0.20**	3B	Audio → satisfaction	-0.20**
1	Audio → social presence	-0.12*	3B	Text → satisfaction	-0.23**
1	Audio → personal focus	-0.17**			
1	Audio → information overload	0.13*	4A	Content ^c → effectiveness	-0.16**
1	Text → symbolism	-0.06	4A	Length ^c → effectiveness	0.02
1	Text → social presence	-0.13*			
1	Text → personal focus	-0.08	4B	Content ^c → satisfaction	-0.12*
1	Text → information overload	-0.08	4B	Length ^c → satisfaction	-0.03
2	Content ^c → symbolism	0.02	5A	Symbolism → effectiveness	0.39**
2	Content ^c → social presence	0.10*	5A	Social presence → effectiveness	0.29**
2	Content ^c → personal focus	0.10	5A	Personal focus → effectiveness	0.37**
2	Content ^c → info. overload	-0.16**	5A	Info. overload → effectiveness	-0.28**
2	Length ^d → symbolism	0.12*			
2	Length ^d → social presence	0.06	5B	Symbolism → satisfaction	0.34**
2	Length ^d → personal focus	0.09	5B	Social presence → satisfaction	0.22**
2	Length ^d → information overload	-0.05	5B	Personal focus → satisfaction	0.47**
			5B	Info. overload → satisfaction	-0.12
3A	Audio → effectiveness	-0.09			
3A	Text → effectiveness	-0.13*	CV	Age → satisfaction	-0.11*

* $p < 0.05$.

** $p < 0.01$.

^a Hypothesis: paths representing significant relationships (i.e., $p < 0.05$) involving control variables are denoted with a “CV”.

^b Standardized path coefficient (SPC) from structural model (Fig. 3).

^c Subjective message content = 0; instrumental/objective message content = 1.

^d Short message length = 0; long message length = 1.

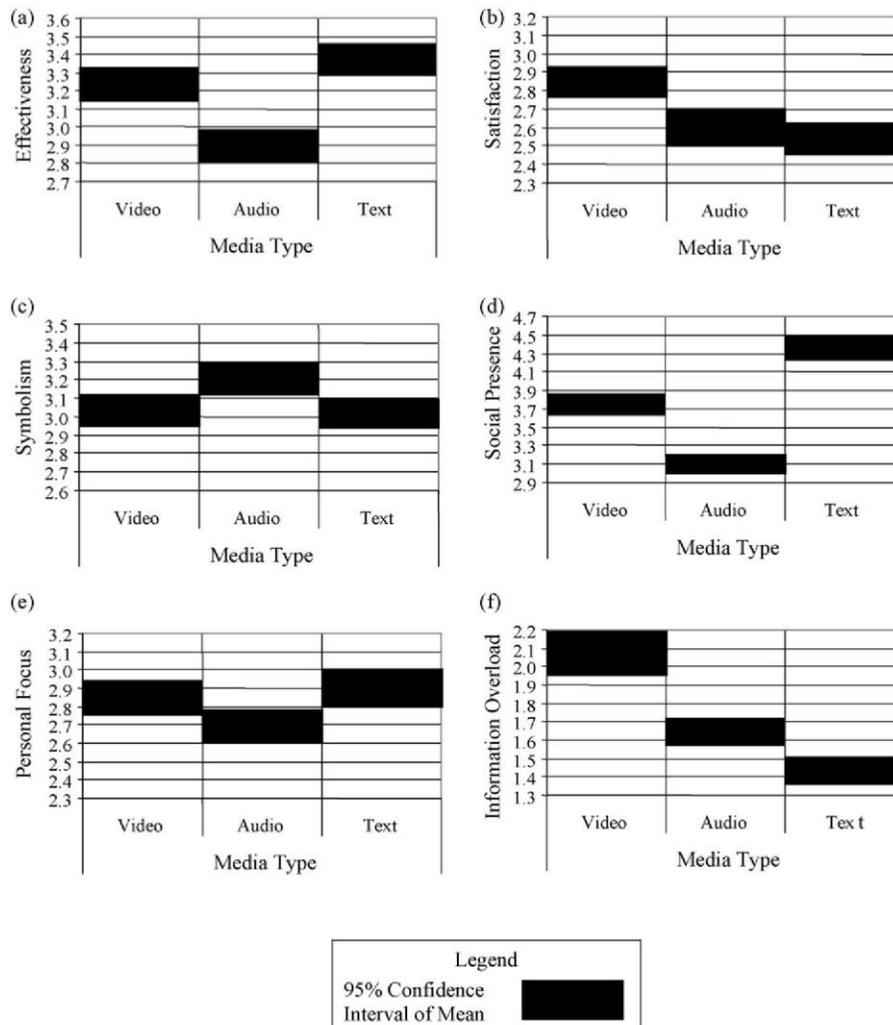


Fig. 4. Latent means of media features across media type.

5. Discussion

Our study suggests that the notion of richness may be too abstract, and that media effects are conceptualized better in fine-grained constructs, such as symbolism, social presence, personal focus, and information overload. A second finding was that media type had significant but weak direct effects on symbolism, social presence, personal focus, and information overload and that media type was somewhat more strongly associated with satisfaction. A third finding was that the observed patterns of relationships between media type, communication outcomes, and richness features deviated from predictions of MRT. In four out of six cases, latent variable means across media type did not exhibit the predictions. These results suggest that users who espouse beliefs of “richness” as the rationale for media choice might actually be basing their media choice decisions on affective motivations rather than on information processing capabilities.

The findings need to be interpreted with some caution due to several limitations of our study. Two dimensions of media richness – feedback (bi-directionality) and language variety – were not captured. Strictly speaking, this exclusion limits the findings to contexts similar to dynamic web-based multimedia (e.g., streaming audio/video messages). The subjective/objective dimension of message content was chosen because of its close association with the use of symbols. Other dimensions of message content must be examined in future research. In addition, the problem of case-category confounding must be recognized.

The findings that media type is more strongly associated with satisfaction and effectiveness than with symbolism, social presence, personal focus, and information overload are somewhat puzzling. This may suggest that key predictors were not included in the study.

6. Conclusion

Our study extended media richness and communication research by moving from an intensely social organizational context to one in which some of the participants are less familiar with the organization’s norms and values. This approach parallels the context in which many people today use dynamic web-based multimedia to obtain initial information from organizations.

The study provides two conclusions. First, the notions of media and information richness oversimplify the complex relationships between media, message, and receiver-based communication outcomes. The second is that media richness theory is a poor predictor of the effects of media type on communication outcomes and media richness, due to its non-monotonic nature across media types, and the weak relationships between media type and media features.

Appendix A

A.1. Communication outcomes

Effectiveness (5-point Likert-type scale: strongly agree to strongly disagree; [1,22])

1. The information was well organized.*
2. The information was presented in a confusing way.
3. Overall, this way of presenting the information was effective.*

Satisfaction (5-point Likert-type scale: strongly agree to strongly disagree; [9])

1. I really prefer this mode of communication.*
2. The way the information was presented was satisfactory to me.*
3. I am satisfied with the method of communication.*

A.2. Information richness

Symbolism (5-point Likert-type scale: strongly agree to strongly disagree; [26])

1. This advertisement carried symbolic meaning in addition to the actual words.*
2. This advertisement told me a lot about the organization beyond what was said.*
3. This advertisement communicated information about the values, beliefs and culture.*

Information overload (5-point Likert-type scale: strongly agree to strongly disagree; [5,18])

1. There was more information than I could interpret right away.*
2. Too much information was provided at one time.*

A.3. Media richness

Social presence (7-point semantic differential; [22])

1. Unsociable–sociable
2. Insensitive–sensitive
3. Cold–warm
4. Impersonal–personal

Personal focus (5-point Likert-type scale: strongly agree to strongly disagree; [22])

1. I felt this message was communicated to me with a great deal of interpersonal warmth.*
2. I almost feel like I know some of the people in the advertisement.*
3. I was able to put a human face on the people communicating with me through the advertisement.*
4. I felt like the people in the advertisement really cared about my well-being.*

*Responses were reverse coded: strongly agree = 5, strongly disagree = 1.

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