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Combinatorial Media Use in Organizations: Understanding Why People Use More Than One Medium to Communicate

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**Combinatorial Media Use in Organizations: Understanding Why People Use
More Than One Medium to Communicate**

by

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Dedication

To my family: Tab, Sarah, and Kyle Stephens;
and Leslie and Eddie Keilberg

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**Combinatorial Media Use in Organizations: Understanding Why People Use
More Than One Medium to Communicate**

Publication No. _____

Keri Keilberg Stephens, Ph.D.

The University of Texas at Austin, 2005

Supervisors: Larry D. Browning & Ronald E. Rice

This study develops a theoretically-driven model for examining how we use discrete media and media combinations in organizations. Using a multi-theoretical base, I draw from three main areas of literature: that which demonstrates the value of using media in combination, the uses of discrete media, and media-use influence theories. From there, I use the literature to develop a coding scheme that quantifies interview data. Using a sample of 66 experienced media users representing diverse industries and two countries, U.S. and Norway, the resulting 4,826 codes generated through content analysis provide the base for the analyses seen here. Persuasion and documentation predicted the use of a media combination, while entertainment predicted the use of a discrete medium. Being an interorganizational communicator predicted using media for persuasion and being a U.S. worker predicted using media for entertainment. Intraorganizational communicators use media for information reasons as do workers from Norway. Using a finer grained analysis and examining the specific

discrete media, I found that email is used for documentation while face to face (FtF) is used for persuasion. Furthermore, the Web is used most often for information reasons. An examination of the specific media combinations revealed that the Web is used most often first in a media combination and it is used for learning, competitive intelligence, and preparation reasons. It also revealed that FtF is the medium most frequently used second in a media combination and that taken together, all the media-used-second can be characterized by their availability of audio cues and their ability to connect with external resources. Finally, the use pattern of complex sequences closely resembles FtF. After discussing the limitations of this research, these findings lead me to identify five areas for future research: (a) expand our understanding of social influences in media combinations, (b) further develop our understanding of how the Web is used as a vital part of a process-oriented view of communication, (c) continue developing coding schemes that characterize uses and influences on media, (d) explore the link between overload and media combinations, and (e) link the persuasion findings here to important organizational outcomes like efficiency and effectiveness.

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CHAPTER ONE: INTRODUCTION

Introduction

Technology can be a communicator's friend or foe. It depends on how we use it. Over the past fifteen years of my professional work life I have seen how certain people use media strategically and succeed in their work. Some people are great communicators when they meet others FtF. But what happens to the person who is not a great FtF communicator because he or she is shy or needs time to think before responding? Should we assume that everyone can be successful using media in the same way?

It is the communicative aspect of how people use media at work that interests me and drives my research. Media, by themselves, are just objects, "simply dead matter" (Poole & DeSanctis, 1990). But when two or more people interact, media become an important component in the *process* of communication. As communication scholars, we often teach communication as being a process, but our research tends to simplify this process to the lowest common denominator—using one medium for one task. The goal of this research is to begin to study media use as an integral part of the *process* of communication.

This is not an easy task. It is further complicated by the fact that so many media are available for use today. Organizations themselves have been considered "meta-channels" because they have so many channels available for communicating (Stephens, Rimal, & Flora, 2004, p. 109). Some media—e.g., email and the telephone—have reached critical mass in the workplace and are used extensively. The latest estimates

from the Computer Industry Almanac claim that the number of world-wide Internet users will top one billion this year and the number of personal computers in use will top one billion in 2007. While not all of this use is organizational, much of it is. Other media—e.g., instant messenger, and blogs—are being used, but are not fully diffused.

As organizations scramble to understand, and often control the use of media in the workplace, policies and rules have resulted. The American Management Association (AMA) began surveying organizations on their electronic policies in 2001 and their 2004 findings show significant changes. For example, the number of organizations in their study providing email policy training doubled from 24% in 2001 to 54% in 2004. Furthermore, 20% of their respondents had had an email or an instant message subpoenaed for regulatory or legal reasons. These policies concerning use point to the pervasiveness of some media, like email, in organizations and it leads me to be intrigued about the details of how media are actually used in organizations.

The notion of comparing communication channels is a longstanding tradition in communication scholarship. If we look specifically at organizational studies, they typically examine a managerial context. For example, how do managers send messages via a channel that allows them to most effectively or efficiently reach an employee (Daft & Lengel, 1984, 1986; Daft, Lengel, & Trevino, 1987; Dahle, 1954; Walton, 1959, 1962). Contemporary studies have focused on rank-ordering existing media and attempting to match media to their various uses (e.g., Media Richness Theory and Uses and Gratifications). But as scholars have shown, simply rank-ordering media that change over time is an oversimplification of how media are used (e.g., Orlikowski,

2000), and is focused less on process and only on an “immediate incident” (Saunders & Jones, 1990, p. 29).

Today, when we go into the field and observe people in organizations using technology, we quickly see that people do not use one medium isolated from others. For example, people often send an email and then immediately pick up the telephone to follow-up with that same person. If they reach their intended recipient, they say, “I just sent you an important email, so be sure and read it.” Not only does this example likely ring true with most people’s experiences, but prominent scholars in interpersonal communication (e.g., Walther & Parks, 2002), psychology (Hesse, Werner, & Altman, 1988), and management (Boczkowski & Orlikowski, 2004; Saunders & Jones, 1990) have issued calls to study the phenomenon of combinatorial media use. Walther and Parks explain, “communication efficiency may rest on sequences or combination of media rather than isolated choices about a discrete medium” (p. 534). Communication usually occurs in an embedded context of choices and, as organizational communication scholars, we often consider issues of efficiency and the availability of media in a given organization. Contemporary communication devices also have multiple media embedded in them which makes distinguishing their functions difficult (Flanagin & Metzger, 2001; Hollingshead & Contractor, 2002, Vertegaal, 2003). For example, a personal digital assistant (PDA) can have a database stored in it, can access the Internet, send email, and may even have an integrated mobile telephone. As a result, we need to develop theories to better explain combinatorial media use.

If we step outside the media use literature to a place where each one of us reading this document has experience, the educational classroom, we immediately see that multi-modal learning has been studied extensively. In both the traditional classroom and now in the distance education arena, researchers have shown that if teachers want to improve retention, they should present material using different simultaneous sensory modes (Kalyuga, Chandler, & Sweller, 2000; Mayer, 1997; Mayer & Moreno, 1998; Mousavi, Low, & Sweller, 1995; Paivo, 1990). Paivo's dual processing model provides the explanation for how the combination of oral and visual information affects working memory. As college teachers, combining media is likely something we do in our classroom. Sometimes we present the same material using simultaneous multi-modal capacities, and other times we simply provide written notes prior to giving an oral lecture. Because communication, including that occurring in organizations, often has instructional goals (Daly & Vangelisti, 2003), it is possible that similar effects can be found using combinations of media in an organizational context (Rice, Hiltz, & Spencer, 2004).

Perhaps we have not yet studied these combinations of organizational media use because we believed that new media would substitute for more traditional ones (Daft & Lengel, 1984), but that has not happened (Lipnack, & Stamps, 1997; Rice & Shook, 1990; Rice, Grant, Schmitz, & Torobin, 1990; Stevens, Williams, & Smith, 2000). And now with recent advances in mobile devices, such as cellphones and portable computers, organizational members have even more media options. Another reason that we might be slow to examine this phenomenon is that it is convoluted—there are many

potential combinations and few theoretical perspectives to guide this work. But because people have not simply replaced one medium with another and they are quite likely using combinations (Flanagin & Metzger, 2001; King & Xia, 1999; Stevens et al., 2000), it is important that we study how these trends are evolving.

We know that organizational members are using media in combination, but we have very little descriptive data accounting for how this happens. This study will build on the limited empirical base that does exist. After we have a more descriptive understanding of combinatorial media use, it will be important to link these use-patterns to outcome measures like efficiency and effectiveness. But it is hard to determine causal links until we have the phenomenon well-described. For this reason, this study will be ontological and will focus on the nature of media combinations rather than the effectiveness or efficiency of the various combinations.

Research Method Rationale

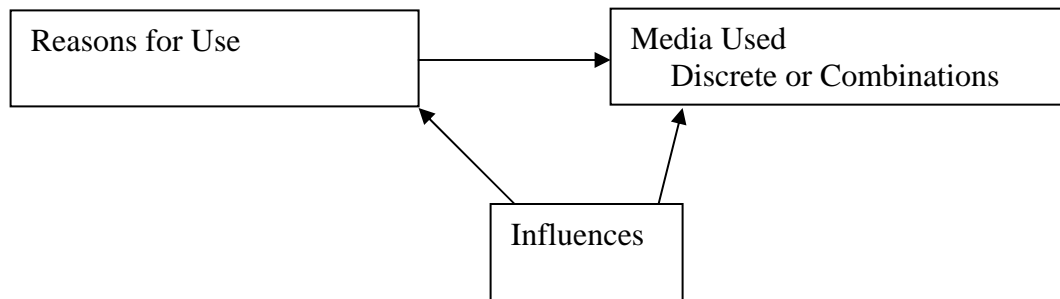
Because I realize that there are inevitable tradeoffs in any research (Weick, 1979), it is important that I also briefly explain the research method rationale. One of the best ways to understand an ill-defined phenomenon, like combinations of media use, is by using field methods that allow a researcher to understand the phenomenon from the view of the user (Patton, 1990). While observational methods might yield a rich dataset, it is likely that a few people from only a handful of organizations could be observed. Surveys would overcome that limitation, but since combinatorial use can literally contain hundreds or even thousands of combinations of media, arriving at an all-encompassing instrument is unrealistic. For this reason, I have chosen to rely on

interview data to capture near-actual use of media. By using open-ended comments, these measures are not constraining the types of media that can be noticed by my data.

I also used a data set that I collected, with a research team, for the past three years. Earlier analyses and publications from this dataset focused on broad questions and used a qualitative methodology (i.e., Browning, Sætre, Stephens, & Sørnes, 2004; Sørnes, Stephens, Browning, & Sætre, 2005; Sørnes, Stephens, Sætre, & Browning, 2004). This research represents the first attempt to quantify this data.

Chapter one reviews the theoretical and empirical work focusing on how people use media and media combinations to communicate. I use this prior work to develop a model that links reasons for media use, influences on media use, and media combinations. See Figure 1.1 below.

Figure 1.1. Model Category Overview.



The following questions and hypotheses are derived from the literature review that follows in chapter two. They are provided here as a preview of chapter that follows.

Reasons and Media Use

H1: Across all media, information purposes are the most frequently stated reasons to use media.

H2: The Web will be the top medium used to get information.

H3: Experienced organizational members will use discrete media for social, play, leisure, and insight reasons.

RQ1: What reasons do experienced organizational members give for using media combinations?

Influences and Media Use

RQ2: What influences people to use media?

H4: People who consider media traits are more likely to use media combinations.

RQ3: Which of the influence categories predicts discrete and combinatorial media use?

H5a: People in interorganizational job roles are more likely to use combinations of media than those in intraorganizational job roles.

H5b: Managers are more likely to use combinations of media than are non-managerial knowledge workers.

H5c: U.S. workers are more likely to use combinations of media than those from Norway.

Influences on Reasons

RQ4: Are the various reasons for use affected by different influences?

H6: People in interorganizational job roles will use media for persuasion more often than people in intraorganizational job roles.

RQ5: Are managerial status and national culture associated with reasons for media use?

Specific combinations

RQ6: Do the reasons for using media vary across the specific discrete and combinatorial media?

RQ7: Do the influences vary across the specific discrete and combinatorial media?

RQ8: By examining media used second in a combination, what do we learn about (a) media used second in general, (b) second media use and influences, and (c) second media use and reasons for use?

RQ9: How are complex sequences different from combinations and discrete media with respect to influences and reasons for use?

After developing these research questions, chapter three addresses the research method and provides a summary of the analyses at the end of that chapter. Chapter four reports the results. In chapter five, I discuss the findings in detail, list the study limitations, and develop five main areas for future research.

CHAPTER TWO: REVIEW OF LITERATURE

Chapter Objective

A major challenge in studying organizational media use is making sense of the vast interdisciplinary literature that has evolved over the past four decades. An outsider might say that as a community we have developed a laundry-list of variables—e.g., task, norms, preference, culture, experience, availability—that can influence use. Further, this list changes over time because the media, people, and organizations are in constant flux. For example, people change jobs and their new organizations have their own set of norms that might affect media use.

To build a theoretical framework, I rely on several diverse theoretical perspectives. Prior empirical studies tend to approach their theoretical grounding in one of three ways: (a) conduct a test using one theoretical perspective, (b) compare two theoretical perspectives, or (c) combine several theories and use them to guide the research. My tactics follow “c,” the multi-theoretical approach. Not only is this a recognized way to ground media use research, but it also has the potential to be more comprehensive. Because my research attempts to build an empirical base from theoretical work, and we have limited knowledge about media combinations, having a broad theoretical base increases the likelihood of grounding this study adequately.

In this literature review I will first clarify a group of constructs relevant to this study. Next, I will review eight theories that provide reasons for how people might use media combinations, along with an additional theory for why they use discrete media. These comparisons form the basis of my first set of research questions and hypotheses

and they are consolidated into a comparative table and a visual research model. After establishing the reasons people use media, I examine the next part of the model, influences on use. The theories in this section are categorized into media traits, social influence, individual differences, and organizational context. These four major categories form the basis of the second set of research questions and they provide the categories I use for the subsequent content analysis. I also ask if there are relationships between the reasons and influences sections of the model. Finally, I propose questions that will explore the details of specific media combinations.

Guiding Constructs

Combinatorial Media Use

“Combinatorial” is a term used in mathematics and chemistry to describe ways to use complex mixtures to optimize a process. For example, chemists using the combinatorial approach no longer try to purify complex mixtures of chemicals, but rather use those mixtures in their quest to find new biopharmaceuticals. Applying this term to communication means we might investigate the complex sequences of media use to help us find optimal ways to communicate. Here, I use the word *combination* to capture two distinct, but related, concepts: simultaneity and sequentiality. I rely on the definition of simultaneity as referring “to two or more entities that exist together at the same moment” (Monge & Kalman, 1996, p. 83) where entities are “conceptually distinct units chosen for study” (Monge & Kalman, p. 73). In this research the entities are physically distinct media, such as a pager or FtF. Prior research suggests that media can be used simultaneously in two ways: multi-tasking implications and integrated

media. Media multi-tasking is very common. For example, many people talk on the telephone and “surf” the Web at the same time. Another example is found in Markus’ (1994a) case study where she observed that during FtF meetings, people who had their computer email open would constantly hear audible beeps when email arrived.

The second way to think about simultaneous use, integrated media, is a concept referred to using the metaphor of recombinant and recombination (Lievrouw & Livingstone, 2002). Examples of integrated media include multi-purpose cellular/mobile phones. Currently, especially in Europe and Southeast Asia, it is common practice for people to use their cellular/mobile phone to send text messages (SMS) that resemble email or instant messages. Medical organizations are also regularly using personal digital assistants (PDAs)—like Palm Pilots— to check email, access medical textbooks, find stored patient information, and access the Internet to check on drug information (Miller, Beattie, & Butt, 2003).

The other type of combination, sequentiality, “refers to a succession of entities over time” (Monge & Kalman, 1996, p. 75). For example: a person might meet her colleagues FtF and then send them an email providing written documentation of what they discussed. While I have distinguished between these two forms of combinations, for the purposes of general model creation, I will combine them into the overarching concept of combinatorial media use. This also helps remove the ambiguous time parameter used to distinguish the two media use events.

Media

Another key definition in this work is “media.” In early media use studies, the most common term used to describe what they studied was “channel,” yet when we peruse their studies, we see that they often use specific media (i.e. bulletin boards or conversations with supervisors) in their measurement instruments. Thayer (1968) claims that the difference between a channel and a medium is that “media are not themselves channels of communication” (p. 260). He claims that media are the means to distributing data—most often understood as hardware, while channels are “functional links between and among people when they do in fact utilize in communication” (p. 261). This distinction is helpful as we examine media today because he explains that one medium can have several different channels of communication.

In this paper, I will use the term “media” for practical reasons. When scholars survey users, people tend to list specific media when they respond. Thus it is important to provide research participants with an accessible way to define how they use media to communicate. However, I do embrace Nass and Mason’s (1990) suggestion to focus less on the specific media and more on the theoretically meaningful variables associated with a given medium. Therefore, I believe that interpreting the data in terms more theoretically meaningful than specific media, is a task accomplished subsequent to data analysis. The meaning-creation step is ultimately the researchers’ responsibility.

For clarity, I use the term “discrete medium” to register the use a single medium for a given task. When people talk about using more than one medium in combination for the same task, I call this “combinatorial media use” or “media combinations.”

Finally, there are two different types of combinations that are important to this study. The first type involves two media and they are mentioned sequentially. The second combination *involves more than two* media mentioned in a sequence and this is called a complex sequence. Therefore, I have three media groupings that I discuss: discrete medium, media combination, and complex sequence. Next, I will examine terms that clarify how people use these types of media.

Use Versus Choice and Acceptance

Conceptually, I distinguish between the terms “use” and “choice.” Here I use the word “use” to describe what organizational members *do* with media because I want a neutral word that accurately depicts how individuals interact with media. A common alternative, the term “choice” is used in many studies, but it implies that organizational members have the freedom to consciously pick their media. Prior research shows that there are many influences—for example availability of a media—that change how media are used. I also need to clarify how I measure use empirically. “Use” is rarely measured using actual behaviors (Timmerman, 2000). Most typically, the studies ask people to self-report use/choice; thus the data more accurately reflects preferences for use, or reported use. Because I use interview data for this study, I am not measuring “actual use” in the sense of computer-monitored email logs or saved written memos. Interviews are considered reported or recalled use (Rice & Shook, 1990).

It is also important to clarify that *use* does not necessarily mean acceptance. Hiltz and Johnson (1989) define acceptance as “successful implementation or adoption of a CMC [Computer Mediated Communication] or MIS [Management Information

Systems]” (p. 387). In organizational settings a medium might be formally or informally mandated. An example of this organizational pressure on media use is seen in a case study of Barbara, a consultant who uses the telephone for most conversations with clients (Browning et al., 2004). She explains that her company expects consultants to use the telephone because they communicate real-time with the client. Later, when clients receive a bill, they remember the actual time spent in the conversation—as opposed to the time a consultant spends alone crafting an email—and they gladly pay the bill. In this situation, Barbara uses the telephone, but doesn’t necessarily accept it as the best way to communicate.

Combinations Exist in Organizations

While there are theories and empirical findings hinting that media are not always used in isolation to accomplish a task, very few contemporary studies address combinatorial use directly. Saunders and Jones (1990) are an exception because they criticize prior media selection as being focused only on an “immediate incident” (p. 29), and not considering media traits “within a sequence of communication interactions” (p. 33). While their research is in the context of managerial decision making, they believe that information acquisition is a dynamic process that unfolds over time and often involves multiple sources and media (Saunders & Jones, 1990). It is more common for organizational scholars to identify more process-oriented views—of which combinatorial use qualifies—as important to study. Belanger and Manheim-Watson (2004) studied communication practices within the sales division of two organizations and found that people often chose a variety of media either in a sequence or

simultaneously. Woerner, Orlikowski and Yates (2004) found similar results when they studied media use in a Fortune 500 company. They claim that “the use of multiple media, especially synchronous media...may be the key to the effective working of many teams, both virtual and hybrid” (p. 24).

Evidence of media mixes appears as a finding in several additional studies. For example, Nicholson (1985) studied usage patterns in voice plus data systems and found that communicators often use combinations of media or they send separate messages using two media. Stevens, et al. (2000) report that eight of their respondents said they might use the Internet as a *first source* depending on task appropriateness. Email is also used as a first source, as seen in Markus (1994a) study. She found that managers often used the telephone to follow-up when they read emotional content in their email. Finally, in their chilling account of how the mobile phone and Internet were used during September 11th, Katz and Rice (2002) show the value of both sequentially and simultaneous media use. Now that I have highlighted some of the empirical and theoretical work on media combinations, let us dig deeper into the broad theoretical base of why people might use combinations.

Theories Guiding Reasons for Using Media Combinations.

Intuitively and experientially, the idea that people use media combinations (e.g., email first and telephone second) to accomplish tasks has face validity. While combinations of channels have been studied sporadically since the 1950s, it is difficult to make sense of the theories used to guide these studies because they represent diverse perspectives. To examine these perspectives, I will next review the eight core

theoretical perspectives that provide insight into why media combinations matter and what they might allow organizational members to accomplish.

Information Theory & Cost Minimization

Communication scholars have relied on Shannon and Weaver's (1949) information theory (see Dahle's 1954 study) and Marshak's (1968) cost minimization theory (see Hsia's 1968 study and Reinsch & Beswick, 1990) to show that an oral plus a written channel improves recall. The similarity between these two theories is their view that redundancy is good because it fills in the gaps and reduces errors. These concepts are appealing to organizational scholars because they are relevant for both rational and interpretive views of an organization. Empirically, most of this research occurred several decades ago and is considered stock knowledge, but there are also contemporary theories from psychology that support the finding that people use multiple media to improve comprehension (e.g., Pavio, 1990).

Dual Coding Model

In addition to communication theories, contemporary psychology and education scholars have studied combining channels. The field of education tells us, as teachers, to use multiple modes when we communicate material to students. In both the traditional classroom and now in the distance education arena, researchers have shown that if teachers want to improve retention, they should present material using different simultaneous sensory modes (Kalyuga et al., 2000; Mayer, 1997; Mayer & Moreno, 1998; Mousavi et al., 1995; Paivo, 1990).

Psychology provides us a theoretical reason for this practice with Paivo's dual processing model. Allan Paivio and his colleagues claim that humans make separate sense of auditory and visual stimuli in a process called dual coding (Paivio, 1990; Clark & Paivio, 1991; Thompson & Paivio, 1994). Paivio found that using a combination of oral and visual information affects working memory. When streams of information work together to provide differently coded information about the same topic, they reinforce each other, improving audience interest and recall.

If we link these findings back to an organizational context, we see that communication often has instructional goals (Daly & Vangelisti, 2003). And even when the goals are not "instructional" per se, we often want others to grasp our messages. Based on the evidence above, it appears that combinatorial media use, especially combinations involving auditory and visual stimuli, can help us accomplish our goals when we want others to comprehend our messages.

Comprehension. Dahle's dissertation (1953), and subsequent publication in *Speech Monographs* (1954) directly examined combinations of media. He ran three different experiments using both organizational and student subjects. His objective was to compare the effectiveness of five different channels of communication—oral, written, oral and written, bulletin board, and grapevine—commonly used to transmit information from managers to employees. Dahle equated effectiveness with comprehension, and measured the results using test-like survey methods. He found that regardless of population, transmitting information using a combination of oral and written channels was the most effective for comprehension. His study defined "oral" as

FtF in a group setting, and his written information was distributed in a printed letter format.

Consistent with Dahle's (1953) findings and the Dual Coding Model (Paivo, 1990), in 1968, Hsia empirically demonstrated that auditory plus visual information increased the accuracy of message transmission better than either auditory or visual stimuli alone. Despite that his subjects were junior high students, his finding is useful because he provides a solid theoretical explanation for how these channels convey information and his experimental design with 192 subjects is robust. Theoretically, he relies on information theory principles to explain how these different channels function to convey information. First, he debunks Broadbent's (1958) theoretical view that people become overloaded when they receive information through multiple channels. To do this he explains that the information received via a discrete channel does not approach a person's processing capacity. Rather, in multi-channel situations, one channel simply provides additional cues that reinforce, not interfere, with information provided by other channels. He claims that "information processed through bisensory modalities usually possesses a certain amount of redundancy...[referred to as] between-channel redundancy" (p. 326). Redundancy, he claims is largely what determines communication efficiency and dependability, while noise—providing old or the exact same information—has the opposite effect.

Reinsch and Beswick (1990) used a cost minimization theoretical perspective to study voicemail implementation. They rely on Marschak's (1968) perspective that how people decide to seek and communicate information contains three types of costs:

access, error, and delay. Access costs—similar to ease of use—could be relevant to combinatorial media use, but error and delay costs are most directly germane. Essentially when things are important or errors are costly, multiple channels are likely to be used. Reinsch and Beswich claim that “dual channel messages heighten redundancy and reduce errors” (p. 807) and this is what prompts message initiators to use multiple media to send messages.

Documentation. Error reduction can occur through documentation. Regardless of the media used in most organizations, there is not a single one that is ideal. FtF is often treated as the richest (or looking at the channel perspective, it contains an oral and a visual channel). But even FtF cannot provide documentation of a conversation. Reinsch and Beswick (1990) studied voicemail use in comparison to other channels, using a sample of 985 employees in a U.S. industrial organization. Their findings suggest that organizational members of fairly low managerial level expressed a need to document their messages. Reinsch and Beswick (1990) claim that this can be connected back to cost minimization theory by showing that people lower in the organizational hierarchy are concerned about blame assignment issues and dual channels help eliminate their concerns. I believe that their perspective on this finding can be widened to include more error costs than simply avoiding blame. For example, after meeting FtF people can send an email to many others who might have missed the conversation but need to be kept informed. Using a written channel to document a verbal conversation can also serve to reshape understanding, or influence other parties. Essentially, it helps reinforce commitments because it is easier to walk away from an oral commitment than

a written one. Finally, using a written channel can help to organize the information and verify understanding.

Overcoming delays. In Marschak's (1968) cost minimization theory he identifies delay costs—the time that elapses before sending or receiving a message, including feedback delays—as important for communication. These costs are complex because they can be both advantages and disadvantages, and certainly they are used for strategic reasons. On one hand, delay costs such as using an asynchronous media can add time and frustration to the communication process. But it is also possible that the variable of rehearsability—having the time to compose a thoughtful message (Dennis & Valacich, 1999)—is so valuable that it overcomes the issue of a delay cost. Delay costs likely filter into combinatorial use when people use two asynchronous media or they use an asynchronous media followed by a synchronous while providing feedback. For example, when making a telephone call, people often reach voicemail instead of a live person. If they work in the same office (easy access to others), they might walk down the hall to have a FtF conversation with that same person. If they are not able to meet FtF with the person, they might choose another asynchronous media (e.g., email) to send a redundant message.

Information theory, dual coding, and the concept of costs provide some solid reasons for how media combinations can be used for retention reasons and for contacting others. Contacting, or getting the attention of other people is further illustrated in the health campaign research. Next I briefly review that literature relevant to media combinations.

Health Campaign Attention Research

Before people can understand a message, they need to see or hear it.

Contemporary media use theories typically say nothing about getting people's attention so they will hear or see a message. There is an assumption that message receivers pay attention to the messages they receive. But is that always the case, especially when people receive many messages? Theoretically, the idea of capturing attention might be linked to combinations of channels through the concepts of redundancy and communication overload.

Health campaigns cannot succeed in changing individuals' behaviors without achieving widespread exposure to their messages (Hornik, 2002; Rimal, Flora, & Schooler, 1999; Rogers & Storey, 1987). Exposure can be maximized through the use of multiple channels (Baker & Rogers, 1993; Flora, Saphir, Schooler, & Rimal, 1997; Rogers & Storey). In the health communication literature, channels are typically conceptualized as either mass media or interpersonal in nature, and campaigns are urged to adopt a mixture of both (Baker & Rogers, Rogers & Storey).

If health campaign designers are using combinations of channels to reach their audience, it makes sense that organizational communicators also use these strategies. Both have access to many different media and both are attempting to capture the attention of the receiver. For example, if a person does not check voicemail regularly, yet always reads email, using a media combination would help them see the message (assuming the sender did not know that the person had a preference for email). But there is an interesting challenge associated with using media combinations which is the

irony of overload. Theoretically, one reason to use multiple channels is to overcome the barrage of messages being sent to the receiver, but in the process, the sender is contributing to overload. Prior studies have shown that organizational members are receiving many more messages today than they did 15 years ago (Browning et al., 2004). So overload is complex and might be both a predictor of combinatorial channel use and it is an outcome. For example, people use media combinations to get the attention to others, yet in the process, they overload that person with too many messages.

Information-Seeking Theories

Thus far I have explored the reasons that people might use multiple interpersonal media for communication. In addition to that situation, there are also times when people use a mass-media for information reasons before they communicate interpersonally. I view this type of combinatorial use as theoretically and practically different from our previous discussion. I also view this as intricately linked to the communication process, because as Flanagin and Metzger (2001) showed, information is the top reason people communicate. It is plausible that people use media combinations to help them accomplish their need for information. They might also use one medium to make themselves look better later in the communication process. So there are two additional reasons that combinations might be used: a need for additional information—or confirmation—and impression management reasons.

Need for additional information. Flanagin and Metzger's (2001) found that information is the main reason people communicate. People probably seek information

from one medium and then use that information in subsequent communication efforts. In particular people might not find everything they need when they search one medium, so they turn to another one for additional or supporting information. Browning et al., (2004) found that people tend to use a “rule of three”—using three sources or media to determine the veracity of information.

While there are many models of information-seeking behavior, Ramirez, Walther, Burgoon, and Sunnafrank’s (2002) model considers how people use computer-mediated strategies when they seek information in communication situations. While their review is limited to social information seeking and it is not grounded in an organizational context, they provide some insight into how sequences might develop. They claim that “it is likely that communicators begin by gathering information passively, evaluate said information, and begin formulating impressions of others, which serves as the basis for determining whether or not to proceed interactively” (p. 224-225). For example, as an academic researcher reading this document you might follow a similar process in identifying a collaborator. You see people present a paper at a conference, evaluate their work, and then decide to approach them for a potential collaborative relationship.

Impression Management

People might search using an anonymous mass media source to help them appear more knowledgeable when they proceed interpersonally. Theoretically, literature on impression management (Goffman, 1959; Rosenfeld, 1994) uncertainly reduction (Berger & Calabrese, 1975), and social costs (Falcione & Wilson, 1988),

explains this behavior. For example, we know from the organizational newcomer literature that people new to an organization can reduce their uncertainty by gathering organizational information. Miller and Jablin (1991) developed a seven-strategy information seeking model. One strategy is called the overt one and it is described as asking direct questions of others. The other six strategies are more covert, and they are most useful when the information-seeking event seems to have high social costs (Miller & Jablin; Teboul, 1995).

Decision-Making Considerations & Task Closure Model

Thus far, many of the theories discussed imply active, mindful decision-making on the part of the media user. Optimizing is a term used to describe people executing a task with the goal of finding the best possible solution (March & Simon, 1993).

Examples of organizational members trying to optimize a task include saving money, saving time—making things more efficient, or doing thorough research and identifying the best market to pursue. Satisficing is another task-related term used to explain a common organizational reality; people do not necessarily have the desire or time to search for the optimal solution, so they are satisfied with good enough results.

Interestingly enough, March and Simon (1993) have shown that people who satisfice often have acceptable results to those who look for optimal solutions. Essentially, people make sufficient decisions even without complete evidence and it can take less time. So the decision to use media combinations and continue a given communication process, might be affected by whether the communicator wants to optimize or satisfice.

Task Closure Model. One model that provides a plausible reason why people might use combinations of media for either optimizing or satisficing, is the Task Closure Model (Straub & Karahanna, 1998). They claim that organizational members begin a task with objectives and those objectives likely vary in how much people even want to finish the task. Their model says that one of the driving forces in decision-making is to complete the task at hand and that this desire influences media use. Evidence from Straub and Karahanna's study supports this suggestion since 64% of their respondents claimed to experience stress when they cannot complete a communication task. To accomplish this objective people might be looking for the best possible solution—optimizing—or they might be trying to finish it as quickly as possible and thus satisfice (March & Simon, 1993).

This look into how people's desire to complete a task affects their tolerance for delays has several implications for why media mixes might be invoked. First, people might be focused on completing a task quickly, so they might use media combinations to speed up the likelihood of a fast response—thus bringing the task to closure. For example, when searching for information about a competitor, people might search the Web and send an email to a friend who used to work for that competitor to try to speed up the probability of a response. People also might be looking for the best solution and bringing closure to the task involves optimizing and using media combinations to accomplish that objective. Ultimately the desire for task closure is linked to cost minimization and tolerance for delays.

Summary of Theories Explaining the Value of Combinatorial Media Use

Here I focused on seven theories that provide reasons for why people might use media combinations to communicate. Information Theory (Shannon & Weaver, 1949) and Cost Minimization (Marshak, 1968) views suggest that combinations can be used to (a) enhance comprehension, (b) learn, (c) control feedback delays, (d) get more information, and (e) provide documentation. The psychological perspective of Dual Coding (Paivio, 1990) provides more support for the reasons of learning and enhancing comprehension, as does the Information-Seeking (Ramirez et al., 2002) view. When the reasons to use media are more focused on persuasion, the Health Campaign Reach Research (e.g., Baker & Rogers, 1993; Flora et al., 1997; Rogers & Storey, 1987) suggests that media combinations are helpful when trying to reach others. Impression management perspectives (e.g., Goffman, 1959; Rosenfeld, 1994) suggest that combinations are used to manage impressions and also get attention. Finally, the task closure model (Straub & Karahanna, 1998) supports the view that media mixes can help people complete their objectives.

As I mentioned earlier, this research relies on using multiple theoretical views to characterize the use of media combinations. When using multiple perspectives, tables can help the reader see a visual representation of where the theories overlap and where they are unique. For an overview of the eight theories just discussed and their corresponding reasons for use, see Table 2.1. On the left side of the table there is a list, derived from theories, of the various reasons that people use media. On the horizontal axis I have listed the eight theories discussed here and identified the places where the

specific theories point to the particular uses. In that table there is also a comparison of these media combination-related theories to the most prominent discrete media use theory, Uses and Gratifications (Katz, Bumler, & Gurevitch, 1974). I will now discuss this perspective and how it relates to discrete media use in the section that follows.

Table 2.1
Reasons for Using Media Derived From Theoretical Views

Reasons for Use	Theoretical Perspectives on Reasons for Use							
	Discrete Media Use	Media Combinations						
	U&G	I.T.	C.M	D.C.	H.C.	I.S.	I.M.	T.C
Information	X							
Sending	X							
Enhancing comprehension		X	X	X		X		X
Receiving	X							
Learning	X	X	X	X				
Problem-solving	X							
Controlling feedback delays			X					X
Need for additional information		X				X		
Need for documentation			X					
Persuasion	X							
Getting attention of others	X				X		X	
Managing impressions/Status	X							X
Social	X							
Relationship maintenance	X							
Social bonding	X							
Play	X							
Leisure	X							
Insight	X							

Note. U&G is Uses and Gratifications; I.T. is Information Theory; C.M. is Cost Minimization; D.C. is Dual Coding; H.C. is Health Campaign Reach; I.S. is Information Seeking Theories; I.M. is impression management; T.C. is Task Closure.

Reasons for Discrete Media Use

The previous section of this document built a case for the reasons people might use media combinations. Here, I focus on the comparison point of discrete media use and the dominant theory of the Uses and Gratifications (Katz et al., 1974) perspective. Many of the reasons are quite similar, but a few are unique to either combinations or discrete media and these form the basis for my first set of research questions.

Uses and Gratifications

One theory, not without controversy, that provides categories of use is Uses and Gratifications (Katz et al., 1974). Uses and Gratifications research was originally developed to study television and radio, but more recently a few organizational studies have also used this approach (e.g., Dobos, 1992; Flanagin & Metzger, 2001). Katz and his associates describe this approach as one that considers “the social origins of, needs that generate, expectations of, sources that lead to, differing patterns of media exposure...resulting in, need gratifications, and other consequences” (p. 20). When developed, this theory was considered unique in that it viewed the “members of the audience as actively utilizing media contents, rather than being passively acted upon by the media” (Katz et al., p. 12). And while subsequent empirical research was generally supportive, the approach was criticized as lacking a theoretical base and as being a simple version of cost-reward and choice theories.

To address the theoretical criticisms, one useful extension to uses and gratifications is expectancy value theory (Palmgreen, 1984). Palmgreen coined the term “gratifications sought and obtained” and he linked these outcomes to cognitive

theoretical premises. He claimed that people use their cluster of beliefs and evaluations to determine which medium to choose. This theoretical model implies that over time the obtained gratifications will influence people's beliefs, thus, experience changes people's view of what media will satisfy their needs—essentially, they learn. I will address the important role that experience plays in a study like this one later in this paper. For the current study, I am not claiming that Uses and Gratifications is necessarily that theoretical. But it does help provide some categories—often developed with prior empirical work—that allow the reasons for media use to be compartmentalized.

With the expansion of the Internet, several communication scholars have suggested that, despite some criticism in the past, Uses and Gratifications is worthy of additional study (Charney & Greenberg, 2002; Lin, 2002; Newhagen & Rafaeli, 1996). Charney and Greenberg claim, “currently, uses and gratifications seems to be most useful for describing the various reasons or motivations for choosing one medium over another” (p. 381). Lin provides a media use paradigm that breaks apart the *use component* from the *influence factors*. She claims that uses and gratifications along with expectancy value theory are helpful as we examine the *use component*. People learn that if they leave voicemail messages, they receive a follow-up telephone call.

If we rely on the uses and gratifications framework to identify the reasons people use media, we find several categories that are relevant to organizational use. Thus far, studies using uses and gratifications as a theoretical base have found that the top three needs filled by a computer are, (a) learning, (b) passing time, and (c) diversion

(Perse & Courtright, 1993). In their brief review of email use, Charney and Greenberg (2002) examined several workplace uses of email and found that many of them resembled classical gratification factors such as entertainment, consensus/control, and surveillance. Steinfield (1986) also found that email use broke into task and social dimensions; these also match a Uses and Gratifications perspective.

Flanagin and Metzger's (2001) study using Uses and Gratification is one of the few that includes the Internet, FtF, and four other computer-mediated media in a single study. They developed a 21 item questionnaire using a combination of three theoretical frameworks: uses and gratifications, organizational issues, and symbolic uses of media. While their subjects consisted of 74% students, they also recruited 26% organizational members, and they included measures relevant to workers' needs. Their factor analysis resulted in ten clusters of uses: information, learning, play, leisure, persuasion, social bonding, relationship maintenance, problem solving, status, and insight into oneself. Once again, as mentioned earlier in a footnote, some of these categories appear quite similar, but they do provide a nice framework to group some uses of media.

To better understand these ten uses, I will provide definitions that are derived from Flanagin and Metzger's (2001) cluster analysis. The information category is simply to get information. Learning is different because it means generating ideas, learning about oneself and others, and learning how to do things. Cluster three, to play, was the response to the item play. Leisure implies something slightly different from play in that it means to be entertained, to relax, and to pass time when the person is bored. The fifth area is persuasion, meaning to negotiate, bargain, or get someone to do

something for you. Social bonding relates to loneliness in that it contains the items to feel less lonely and to have something to do with others. Relationship maintenance is also a social dimension and it means to get to know others, to provides others information, and to stay in touch. Problem-solving concerns the task at hand and means to solve problems, to make decisions, and to contribute to a pool of information. The ninth cluster is called personal status and it is to impress people or feel important. The final cluster is called to gain insight into myself.

They found that across media, the main reason people communicate is to get information and that the Internet ranks clearly first for accomplishing that task. FtF was ranked very high across all the ten needs, with only the books and magazine category surpassing FtF in the leisure cluster. D'Ambra and Rice's (2001) findings about the Internet are consistent with Flanagin and Metzger's (2001) study, yet their study was not cross-media. They found that expertise—a variable I discuss in detail later in this paper—influences many aspects of Web use.

Research Questions and Hypotheses for Reasons for Use

These ten needs appeared in Table 2.1 and as you can see, several of them are similar to those uncovered from the eight theoretical perspectives guiding combinatorial use. Both sets of theories mention information reasons; thus exploring this use should be done though research questions. But we do know that the media combination theories take a more process-oriented view of information needs and they focus on uses like learning, information supplementation, and controlling delays. Documentation reasons are only mentioned by the combinatorial-related theory of cost minimization, so

this reason might predict the use of media combinations. Both sets of theories mention persuasion reasons for using both discrete and media combinations, so a prediction is not particularly possible. Social, play, leisure, and insight reasons are only mentioned by uses and gratifications; therefore, these reasons likely predict the use of discrete media. Finally, we do not have clear evidence for why people use media combinations, so this is phrased as a research question. This leads to the following research questions and hypotheses:

H1: Across all media, information purposes are the most frequently stated reasons to use media.

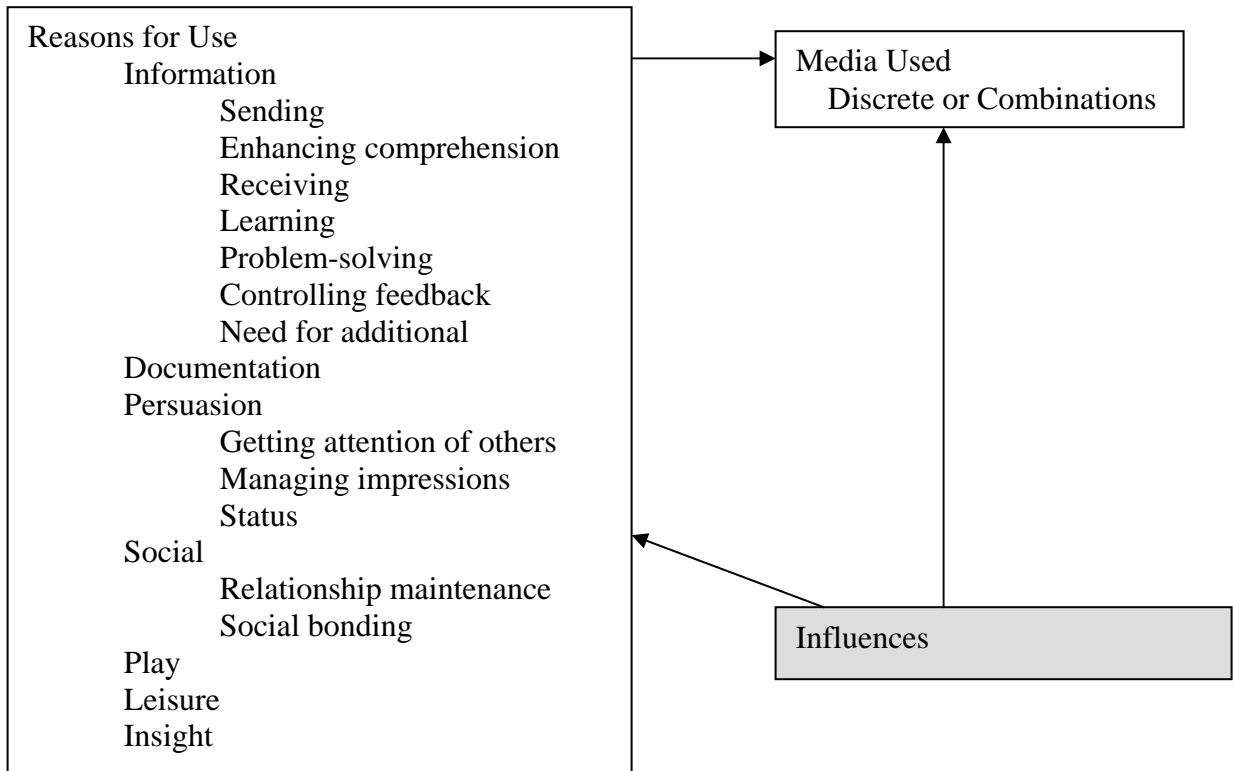
H2: The Web will be the top media used to get information.

H3: Experienced organizational members will use discrete media for social, play, leisure, and insight reasons.

RQ1: What reasons do experienced organizational members give for using media combinations?

Now that I have used theories to develop a list of reasons that people use media, I will put those into my overall research model (see Figure 2.1). You will notice that I have combined what is known about discrete media use and combinatorial use to provide a detailed picture. I have also grayed out the “Influences” category because I have not discussed it yet in this paper. Now that we see the reasons people use media, let us turn to examine the influences on media use.

Figure 2.1. Reasons for Discrete and Combinatorial Media Use.



Influences on Media Use

When we use media to communicate, there are factors that influence the media we actually use. Looking broadly at this literature we find that the influences break down into four main groupings: media traits, social influences, individual differences, and organizational context. To better understand these four areas, I will briefly summarize the theories and empirical literature that speak to media use in general.

Media Traits

One of the most basic underlying beliefs is that a medium is defined by certain traits or inherent features. Theorists subscribing to a deterministic stance believe that the features alone decide how we should use media. Two such theories, Media Richness (Daft & Lengel, 1984, 1986; Daft et al., 1987; Trevino, Daft, & Lengel, 1990) and Social Presence (Short, Williams, & Christie, 1976), attempt to link media traits with desired task outcomes. Both of these theories approach media from a similar “matching” perspective, which means that media should be matched to tasks. To explain this more completely, I will focus on media richness because, as it turns out, these theories are quite similar despite having been developed for different reasons.

According to media-richness theory, a “rich” channel like FtF actually has four useful features: (a) the ability to transmit multiple signals—e.g., nonverbal cues, voice intonations, and the verbal message itself, (b) access to immediate feedback from the receiver, (c) a chance to tailor the message to the real-time situation, and (d) the ability to incorporate conversational language such as slang and ambiguous references. Empirical studies grounded in media richness theory (or social presence theory) tend to

rank-order media along a continuum of richness, based on their traits. FtF normally ranks the highest, and email and letters rank the lowest.

A “lean” channel like email is essentially stripped down and thus lacks the four richness features.

To accomplish the “matching” objective, media richness theorists divide tasks into those that are uncertain and those that are equivocal. In an uncertain situation, people simply need more information to accomplish a task, and this does not necessarily involve interacting with others. Equivocal situations, on the other hand, require people to *interact* with others because of the nature of the content or the need to clarify.

Media Synchronicity Theory (Dennis & Valacich, 1999). Dennis and Valacich challenge media richness theory in three primary ways: (a) empirical evidence weakly supports media richness, (b) it is too narrowly focused on task outcomes, and (c) there are several media traits that must be considered as influential in communication. To address these weaknesses, they develop Media Synchronicity Theory (MST) which is an explanation of media use that includes a development of types of tasks and a set of five media variables affecting use.

First, they claim that media richness oversimplifies the difference between equivocal and uncertain tasks. They divide tasks into two categories, conveyance and convergence. Essentially conveyance tasks are those that disseminate new information to others from many sources. Convergence tasks focus less on the information and more on how people develop shared meaning. Unlike media richness theory, that claims that uncertain tasks are accomplished through conveyance, Dennis and Valacich (1999) posit that both conveyance and convergence are necessary to resolve both equivocal and

uncertain tasks. For example, even an equivocal situation might require both providing information and then subsequently discussing that information.

To address their belief that new media introduce additional communication considerations into how we evaluate the “richness” of a medium, they elaborate on five key variables: immediacy of feedback, symbol variety, parallelism, rehearsability, and reprocessability. Immediacy of feedback is simply how quickly a medium facilitates bi-directional communication. Rehearsability is whether people can edit their message before it is communicated to others. On the back-end of the communication process is reprocessability, or the ability to review and reprocess information. Symbol variety is similar to what Daft and Lengel call multiplicity of cues, and its importance has been stressed by several scholars (e.g., Sitkin, Sutcliff, & Barrios-Choplin, 1992; Trevino et al., 1990). It is the idea that a medium itself sends a symbol, and that some media transmit multiple symbols on different levels. Finally, there is the parallelism consideration. This means that some media can facilitate multiple conversations at once. For example videoconferencing can connect many people from multiple locations and transmit video and audio in a near-simultaneous environment.

While there have been no published empirical tests of MST, this approach is helpful because it identifies variables, like reprocessability, that are not necessarily embedded in a given medium. Instead this is in keeping with recommendations from Nass and Mason (1990) who stress that technologies will change and variable-centered approaches—not simply comparing intact media—are the best way to allow for change. Dennis and Valacich (1999) apply their task considerations and media variables to group process (using TIP, McGrath, 1991) and use their framework to develop a series

of propositions concerning how groups use technology. For example, one proposition states that “for group communication processes in which conveyance is the goal, use of media providing higher reprocessability will lead to better performance” (p. 7). While my concern in this dissertation is not formal groups, many of MST’s concepts apply well to any communication processes. Take the case of a Chief Financial Officer for a bank (Browning et al., 2004). She believes so strongly in the value of rehearsability and reprocessability that she despises the telephone because it provides her no time to plan responses to questions and it does not leave a written audit trail. She clearly states that email is her preferred medium in every situation that is not emotional.

Media traits and combinations. While theories and studies of media traits do not directly address the issue of using media in combinations, there are two plausible intersections. First, as suggested by Dennis and Valacich (1999), parallelism is a variable present in some media combinations that allows the same information to be communicated via different channels. For example, in a videoconference, people can see others and they can hear their voices. Second, if people use media because of traits of the media, then one reason they might choose multiple media is because the traits of one medium were insufficient. For example, if people meet FtF and need to document the conversation, then another media, like email, might be used to summarize the FtF conversation. Taken together, this suggests that when people claim that media traits influence their decisions to use media, they are more likely aware of the limitations of a single medium. This makes them more likely to use a combination of media, over a series of exchanges, to accomplish their objectives.

Social Influences

Because of the mixed support for deterministic theories, many scholars now agree that variables other than those embedded in the medium itself must be considered to create a more complete understanding of organizational media use. Here, scholars also consider the context—often social or organizational in nature—as a key predictor in media use. The most prominent theory found in this arena is the Social Influence Model (Fulk, Schmitz, & Steinfield 1990).

Social influence model. Fulk and her associates believe that the actual variables that influence media use are socially constructed—that communication involves at least two parties and that “others” influence media use. The essence of their contribution is that social variables, like group norms or comments made by coworkers, influence media use decisions (see Rice & Aydin, 1991; and Rice et al. 1990, for explicit tests of social influence on media choice and evaluation). But social influences comprise only one of the five main categories they identify. The other four include: task features, media features, personal experiences, and situational factors. Empirical tests of social influence model are generally supportive (see Rice et al., 1992 for an argument against this general statement of support). A fundamental consideration of all the social influence theories is that other people matter in two key ways. First, enough other people must be using the same or compatible media for communication to occur. This is called critical mass (Markus, 1990) and until the technology is adequately diffused, it cannot be widely used (Rice et al., 1990; Rogers, 2003). Second, group members observe others’ behavior, the consequences of that behavior, and the emotional reactions of others, and they adjust their own behavior (Fulk, 1993). This is not unlike

expectancy value theory (Palmgreen, 1984), discussed earlier with Uses and Gratifications (Katz et al., 1974).

Social influences and media combinations. Social influences also likely affect why people use media mixes to communicate. Other people's behavior offers a solid reason to choose a different medium to communicate the same message. For example, in Markus's (1994a) study, she found that when managers "read evidence of negative emotions" (p. 139) in email, they follow up with a telephone call. Another example is seen when others fail to respond to a first message. In an effort to reach them, people tend to try another medium. But it is difficult to tell if people would use discrete media or combinations more because of social influences. Therefore, at the end of this section, I will ask this as a research question to see if there are differences between these two types of use attributed to social influences.

Individual Differences

Thus far I have provided theoretical perspectives that focus on the capability of media and the role that others play in media use. It is also important to consider influences that are inherently found in an individual. The most prominent empirical finding in this category is that experience with a medium matters (e.g., Fulk, Schmitz, & Ryu, 1995; King & Xia, 1997; Walther & Burgoon, 1992; Williams & Wilson, 1999). In this section of the paper, I will address this first and then move into the concept of personal preferences for media.

Experience matters. One variable that is often credited with affecting media use is experience (Fulk et al., 1995; King & Xia, 1997; Walther & Burgoon, 1992; Williams & Wilson, 1999). King and Xia (1997) found that "an individual's choice of media for

a certain task is significantly correlated with one's experience with the media rather than the rationally evaluated fit between media and tasks" (p. 168). Additionally, experience is a variable that affects media ranking. Some people who are more practiced using a given media will rate it as "richer" than other media, even including FtF (Lee, 1994; Steinfield, 1986).

The main argument resulting from this research is that experienced media users have more stable use patterns than novices. Walther and Burgoon (1992) argue that if we want to understand "the patterns of communication technology use and consequent changes," (p. 147), we need to examine their postadoption behaviors. This is congruent with a rationale offered by Williams and Wilson (1999) in their study on group support systems. They relied heavily on semi-structured interview data and they chose an experienced organization to study because "spurious effects often associated with the adoption of new technologies and innovations, such as overcoming learning curves and unbridled enthusiasm for a new 'toy,' should be minimized" (p. 186). For this study, I will control this variable by using only experienced media users.

It is likely that with increased experience people learn which combinations of media help them accomplish their tasks. For example, Browning et al. (2004) studied experienced organizational users of technology and found that they often use a mix of media to accomplish objectives like persuasion and getting the attention of others. Some of this combinatorial use might be for optimizing purposes, while others might be habitual.

Preferences. In addition to media traits, social influences, and experience, people have their own set of preferences for media that likely affect use. I mentioned

earlier that media richness theory has been criticized because is not always predictive. Characteristics of the person using the media can account for some of the discrepant findings and scholars have found that personal preferences affect media use (e.g., Carlson & Zmud, 1999, King & Xia, 1999). For example, not all communicators prefer having access to nonverbal cues (Walther & Parks, 2002). This likely affects the media they use when communicating.

Summary of Theoretical Influences

The theories I have covered so far in this section tend to group into three areas: media traits, social, and individual differences. Many of these theories fall primarily in one of the three areas, but several cross the theories. To summarize these similarities and differences, see Table 2.2.

Table 2.2
Common Beliefs Related to Influences on Media Use Across Six Theoretical Views

	Media Traits Theories		Social Considerations		
	MRT S/P	MST	SI	DCM	RSOM
<u>Media Considerations</u>					
Immediacy of feedback	X	X			
Rehearsability		X			
Reprocessability		X			
Symbol variety		X		X	
Parallelism		X			
<u>Considerations of others</u>					
Social influences			X	X	X
<u>Individual Differences</u>					
Personal preferences			X	X	X
Experience			X	X	X

Note. Media Richness (MRT), Social Presence (SP), Media Synchronicity (MST), Social Influence (SI), Dual Capacity Model (DCM), Rational + Socially-Oriented Theory Model (RSOM)

Organizational Context

The important role that an organization plays in media use is well explained in the works of Orlikowski and Yates (Orlikowski, 2000, Orlikowski, & Yates, 1994; Yates & Orlikowski, 1992). This work relies on structuration theory and demonstrates that organizational members influence and are influenced by organizational structures, rules, and availability of communication media.

While there are many specific organizational variables that can affect media use, I will focus here on three that have the most potential to affect combinatorial media use: managerial status, job role, and national culture. Theoretically, these variables are often included with other models to add predictive power to our understanding of media use (e.g., Sitkin et al., 1992; Stevens et al., 2000). Media scholars have also studied these variables empirically. I will discuss both the theoretical perspectives and empirical findings that guide this influence category. I end this section with suggestions for how these three variables might function in media combinations.

Job role. Stevens et al.'s Rational plus Socially-Oriented Model (2000) includes media traits, but also considers the individual worker characteristics and the impact of the organization. Their categories are: type of technology, individual differences, job position and function (described as related to task considerations), situational determinants, and organizational factors—i.e., management support. They also have expanded the view of the “task influences category” found in other models to include the concept of job role.

A key job role distinction found in several studies concerns the focus of the organizational communicator. Specifically, people communicating

intraorganizationally differ in their media use from those communicating interorganizationally (Adams, Todd, & Nelson, 1993; Markus, Bikson, El-Shinnawy, & Soe, 1992; Rice, 1993; Rice & Shook, 1990, Scott & Timmerman, 1999). People communicating interorganizationally are typically considered boundary spanners (Adams, 1980). Rice and Shook surveyed people representing two different job categories in each of four different organizations. media usage patterns were able to predict the individuals' job categories. When they combined meetings with email or telephone use in each of the organizations, they explained the variance in job categories ranged from 91% to 94%. Despite the fact that the job categories they studied in each organization differed—e.g., they studied engineers in one organization and police in another—they claim that intra-versus interorganizational orientation is a comparison group of employees worthy of study. Rice (1993) also found some evidence of the differences between these two groups with respect to voicemail use. In his study of six organizations, he found that sales-related job roles tended to rank voicemail as a more appropriate medium than those individuals in technical and professional roles. Adams et al., (1993) compared email and voicemail use in a single organization and they found that email was considered more useful for intraorganizational communication while voicemail was used more interorganizationally. Finally, in their study of teleworkers, Scott and Timmerman (1999) found that virtual workers used different technologies to communicate with internal audiences than those used with customers.

The job role difference might also play a role in how people use combinations of media. Perhaps people communicating interorganizationally use a mix of media because they communicate with people in different organizational cultures. First, it is

in the best interest of an interorganizational communicator to find the best way to communicate with others. At first, they do not know their customers' preferences, so they use a mix to successfully reach them. They also need to be sure their communication partners understand their messages, so they might use media combinations to enhance understanding.

Managerial status research. Several scholars have shown that managerial status determines how people use media (e.g., Carlson & Davis, 1998; Lee, 1994; Markus, 1990, 1994a, 1994b; Rice, Hart, Torobin, Shook, Tyler, Svenning, & Ruchinskas, 1992). These findings, while enlightening, also are complex to understand for two main reasons: (a) the studies cannot necessarily be compared because they tend to study different media or a single medium, and (b) they differentiate between “levels” of management—i.e., senior vs. mid-level, or director vs. manager. For example, media richness should predict that as managers move up in an organization, they should use FtF—the richest medium—more and leaner media less (Fulk et al., 1990). But Markus (1994b) studied effective senior managers and found that they used email extensively, even for equivocal situations. In another well-regarded managerial media study, Carlson and Davis's (1998) compared managers and directors' media use. They found that managers actively choose media that are responsive to the needs of their communication partners and relationship considerations. Directors tend to choose media based on their own personal needs like access to a media. This leads them to conclude that people in various job roles are either “self” or “other” focused when they choose media.

It is challenging to draw conclusions about “all media” when most empirical research has studied how managers use specific media. It is also difficult to combine all managers into a single category. But it would be helpful to know how managers and non-managerial knowledge workers compare in how they use media. Using the research above as a guide it appears that most managers are working directly with many people and have a need to use media to enhance their personal effectiveness. Knowledge-workers, on the other hand, are often characterized as individuals whose work is (a) cerebral (Davis, 1999), (b) requires a formal education (Frenkel, Korczynski, Donoghue, & Shire, 1995; Starbuck, 1992), and (c) autonomous (Robertson & Swan, 2003). They often expect so much autonomy that Robertson and Swan refer to these workers as “gold collar” (p. 835). In many ways, they can be viewed as “self” focused communicators, much like the directors were in the Carlson and Davis study (1998). This leads me to predict that managers, and not knowledge-workers, might be more likely to use combinations of media when they communicate. Markus’s (1994a) study of managerial media use supports this view. She found that when managers “read evidence of negative emotions” (p. 139) in email, they follow up with a telephone call. This prediction is stated below in the form of a hypothesis.

National culture. Another variable identified as accounting for some the variability in media use is national culture (e.g., Mejias, Shepherd, Vogel, & Lazaneo, 1996/97; Straub, 1994; Tan, Wei, Watson, Clapper, & McLean, 1998; Van Birgelen, Ruyter, Jong, & Wtzels, 2002). Hofstede’s (1980, 1991) work comparing national culture differences provides some useful information for this study that includes the U.S. and Norway.

Hofstede's (1980, 1991) work identified cultures according to several dimensions. The individualist/collectivist dimension, along with another dimension called masculinity/femininity, are particularly relevant to a study like this one, that contains data from Norway and the U.S. Hofstede (1991) describes individualism as a characteristic of societies where individual ties are loose and there is a tendency toward putting individual needs above those of others. On the opposite end of the individualism dimension is collectivism. This culture rewards those individuals who put the group's needs above their own. The United States scores the highest of all nations on the individualism dimension and Norway falls 20-points below it (on an 85-point scale). While this still places Norway as moderately individualistic, it suggests that there might be differences in how people from these two cultures use media. For example, people from the U.S. should value media that enhance their individual performance more than people from Norway. However, subsequent empirical studies evaluating the differences between individualism and collectivism have found mixed support. For example, in their test of Hofstede's national culture theory, Rice et al. (1998) did not find that organizational cultural values moderated the relationship of media choice. They did find that collectivist cultures tended to avoid the telephone in more equivocal situations.

The other relevant dimension in this study is known as masculinity, a measure of distance between social gender roles. For example, masculine countries value material success and assertiveness, while feminine countries value quality of life, modesty, and tenderness (Hofstede, 1991). On Hofstede's scale there is a 54-point spread (on a 90-point scale) between Norway and the U.S., with Norway being one of the most feminine countries from his study. With respect to media use, this dimension predicts that the U.S.

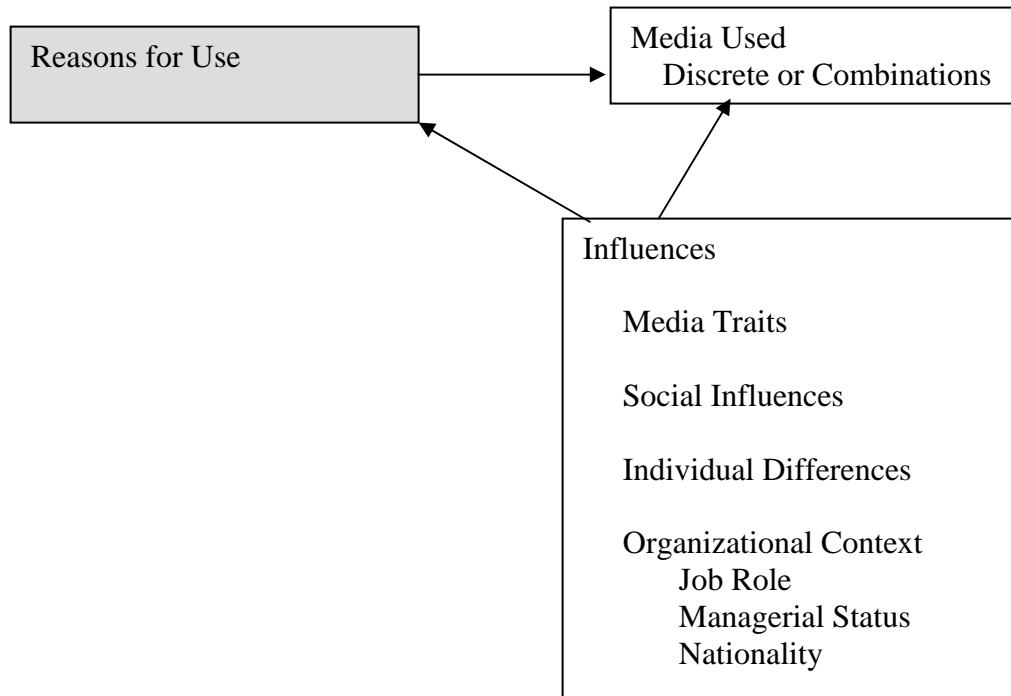
will be more task-focused and Norway will allow more personal and leisure activities while at work. This means that scheduling a doctor's appointment on company time should be fine in Norway, but in the U.S. it is viewed negatively. Despite Hofstede's work on this dimension, prior research has found that Norway is also quite masculine (Sørnes et al., 2004).

While the empirical support for Hofstede's original work (1980) is mixed and is criticized because it only included workers from a single organization—IBM—it does provide a useful framework to begin to make claims about how media might be used in combinations. Taking the two dimensions together, individualism and masculinity found in the U.S., we can assume that Americans will be more task-focused and will do what it takes to enhance their personal productivity. Combining this belief with the fact that the people in this study are experienced media users, I can build a case for predicting that U.S. workers will use combinations more often than Norwegian workers.

Summary of Influences

To see how the four categories of influences—media traits, social influences, individual differences, and organizational context—affect media use, see Figure 2.2. It is possible that each factor has a separate influence on media use, but they might also work together to influence use.

Figure 2.2. Overview Model with Influences Expanded.



Research Questions For Influences and Media Use

RQ2: What influences people to use media?

H4: People who consider media traits are more likely to use media combinations.

RQ3: Which of the influence categories predict discrete and combinatorial media use?

H5a: People in interorganizational job roles are more likely to use combinations of media than those in intraorganizational job roles.

H5b: Managers are more likely to use combinations of media than are non-managerial knowledge workers.

H5c: U.S. workers are more likely to use combinations of media than those from Norway.

Taken together, these questions will provide more insight into the theoretical and the organizational influences on media use. In particular this allows me to identify where discrete and combinatorial media differ with respect to their influences. It also provides more empirical testing of three main organizational variables: job role, managerial status, and national culture.

Linking Reasons for Use and Influences

Returning to the research model, there is a final set of relationships that needs consideration. So far I have shown how reasons for use and influences might predict the use of discrete media or combinations. Now let us turn to examine how influences might affect reasons for use.

The literature review above suggests that some of the reasons might be linked with certain influences. But prior empirical evidence testing theories like information richness (Daft & Lengel, 1984, 1986; Daft et al., 1987), social influences (Fulk et al., 1990), and individual differences, is inconclusive with respect to how they affect the reasons media are used. For this reason, I will ask a research question to see the linkages in this current study.

We do have enough evidence from the literature review to make some predictions and ask additional questions about the function of organizational context on the reasons people use media. First, understanding the types of jobs that interorganizational communicators have—e.g., sales and consulting—we can assume that much of their job centers on persuading others; much more than people in intraorganizational job roles. Because they communicate using some type of media, we

can predict that these boundary-spanners use media for persuasion. Second, examining the past empirical work on managerial status suggests that managers and knowledge workers might use media for different reasons, so we should explore this in a research question. Finally, comparing the masculinity/femininity dimension and the individualist/collectivistic dimension, also suggests that workers from the U.S. might use media for different reasons than workers from Norway, so this too should be a research question.

This leads to the following set of questions:

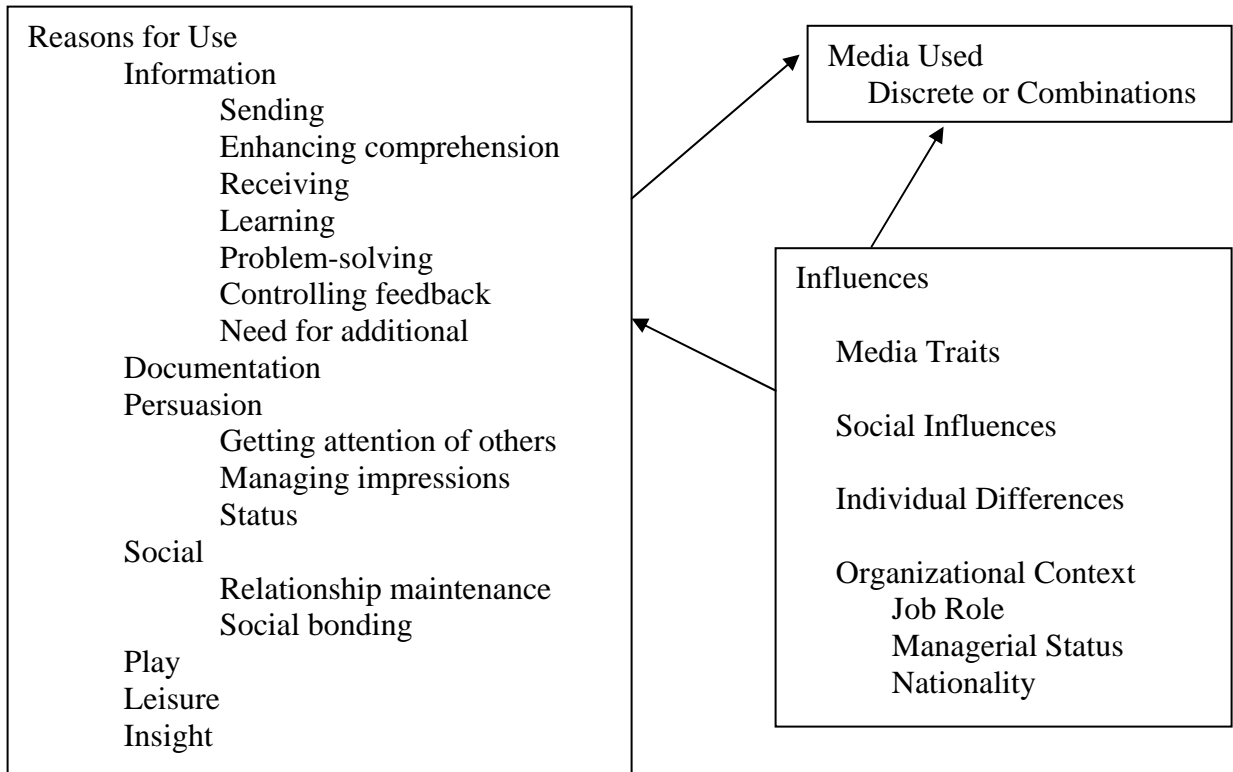
RQ4: Are the various reasons for use affected by different influences?

H6: People in interorganizational job roles will use media for persuasion more often than people in intraorganizational job roles.

RQ5: Are managerial status and nationality associated with specific reasons for media use?

The following theoretical model results in combining all of the predictions and questions into a single figure.

Figure 2.3. Final Model of Combinatorial Media Use.



Delving More Descriptively into Media Combinations

The focus of this study is on media combinations and thus far the questions have compared discrete media use and media combinations. But this is a very high-level, dichotomous view. In the final set of questions, I look at a finer scale to learn more about the specific discrete media and the particular combinations that are used in organizations. Regardless of the prior findings, they will not tell the entire story because what we see at a grand scale might not reflect what is happening on a more micro-media level.

These questions will be more descriptive and will focus on specific media and media combinations. I am interested in examining how the reasons and influences for using media might affect certain discrete and combinatorial media. I would also like to learn more about the sequential nature of combinations. To help uncover why people use another medium after they have used a first medium, I will ask a research question that links this interest to reasons for use and influences. Finally, there is an opportunity to learn more about media combinations that contain more than just two sequential media. If scholars hope to view media use as more dynamic, we need to explore the complexities of these sequences.

This leads to the following final set of research questions:

RQ6: Do the reasons for using media vary across the specific discrete and combinatorial media?

RQ7: Do the influences vary across the specific discrete and combinatorial media?

RQ8: By examining media used second in a combination, what do we learn

about (a) media used second in general, (b) second media use and influences, and (c) second media use and reasons for use?

RQ9: How are complex sequences different from combinations and discrete media with respect to influences and reasons for use?

Chapter Conclusion

The *New Handbook of Organizational Communication* (Tompkins & Wanca-Thibault, 2001) lists information flow and channels as the fourth most studied cluster of constructs in organizational communication. Yet we still only have a basic understanding of how people are using media to communicate today. Despite some early work on combinations of channels/media, there is little contemporary work in this area and scholars are acknowledging that this is an important area for future research. This literature review first provided theoretical reasons for why people might use media combinations and compared this to the reasons people use discrete media. In addition to reasons for use, the next theoretical section covered influences on media use. Finally, I linked the three parts of the research model together and elaborated on the descriptive questions that I will ask that concern specific discrete media and media combinations. Now that the model is constructed and the research questions are stated, the next chapter will address the research method used in this study.

CHAPTER THREE: RESEARCH METHODS

Chapter two reviewed the literature and developed a model linking influences, uses, and media. To analyze this model, I used a multi-methodological approach that combines qualitative data collection with both qualitative and quantitative analysis. This chapter describes the research methods used to test the research questions and hypotheses developed in the previous chapter. I begin with a brief summary of the study and then describe the sample and data collection in detail. Next, I discuss data preparation procedures and the key variables in this study. I conclude this chapter with a discussion of the analytical approaches I used to answer the research questions and test the hypotheses.

Study Overview

Organizational scholars interested in media use have accumulated very little data about the phenomenon of interest here, combinatorial media use. Yet focusing exclusively on the descriptive aspect of this issue does not allow scholars to leverage decades of media use research into this specific area of study. For this reason, I have chosen to use a multi-methodological approach that uses rich descriptions and tests relationships statistically. Here I convert qualitative interview data into quantitative data. In the process, I realize that I violate some assumptions of inferential statistics — particularly issues of probability sampling. However, as you will see in Appendix A, the sample itself is quite diverse. Furthermore, using inferential statistics to understand a particular dataset more completely is acceptable in the eyes of statistical researchers (e.g., Tabachnick & Fidell, 2001) and has been used for this type of media research

before (e.g., Ducheneaut, 2002). The challenge lies in making conservative generalizations from the results (Keyton, 2006).

You will notice that I use the word “we” when I discuss data collection. I have been involved with this interview data that I have collected, with a research team, for over three years. This study represents the first attempt to quantify these 2500 pages of transcribed text. The scope of this current project nudged me to use N6 (formally called Nudist) software from QSR International. While this current research is quite narrowly focused on the variables associated with the model developed for this study, as mentioned earlier in this document, prior narrative analyses from this data have resulted in several publications (Browning et al., 2004; Sørnes et al., 2004, Sørnes et al., 2005).

A major reason that we chose to interview participants is that we can learn things that are difficult to observe directly (Lindlof, 1995). A qualitative approach is also especially useful for studying topics that are emergent and vague (Patton, 1990), such as combinations of media use. You will also notice that the interview questions mentioned later in this document did not specifically ask how people use media combinations. This is both an advantage and disadvantage to this study and will be discussed further in the limitations section of this document. What you see here is non-prompted talk about media use that includes how people use combinations of media. This non-prompted data is advantageous because it allows for media combinations to emerge from the interviewee rather than be pre-defined prior to the study. Non-prompted data is less subject to social desirability and less subject to type one errors. This overcomes a limitation mentioned in other media use studied (e.g., Flanagin &

Metzger, 2001). In the section that follows, I elaborate more on the participants and interview procedure.

Data Collection

Participants

This dataset consisted of 66 individuals representing 64 different organizations from two nations. This data set was particularly appropriate for this study because it represents knowledge workers in many organizations who are all experienced media users. The four guiding selection criteria for participants were: (a) they must use media—including newer forms such as the Internet—extensively in their daily work; (b) they must frequently communicate intra- or interorganizationally; (c) they must be considered knowledge workers; and (d) as a whole they must represent diverse industries, occupations, ethnicities, organizational tenures, and sexes. To select the participants, we used a snowball sampling technique where each of the researchers tapped their personal networks for recommendations on participants who met the four criteria. We specifically asked people to identify others that were diverse industries. Considering that we were not identifying a specific population, but rather looking for specific types of people, this technique is viewed as appropriate (Babbie, 1995).

The resulting sample consisted of a cross-section of users representing gender, different industries, organizations of different size, and a fixed or mobile office (see Table 3.1). The sample consisted of people working for organizations based in the U.S. (47%) and Norway (53%) who represented multiple organizational levels and industries, including e-learning, entertainment, software-production,

semiconductor, oil and gas, and government agencies. The sample was 36% managers and 64% non-managers. Finally, 56% of the sample was people who functioned in interorganizational job roles, while 44% were in intraorganizational job roles.

Table 3.1

Descriptives of Interviewees Including Organizational Variables

Demographic Variables	Percent
Male	71%
Female	29%
Established Organization	68%
Entrepreneurial Organization	32%
Over 50 employees	58%
50 and under employees	42%
Sells a Product	56%
Sells a Service	44%
Mobile Employee	18%
Fixed in one location	82%
Manager	36%
Non manager	64%
External Organizational Members	56%
Internal Organizational Members	44%
U.S	47%
Norway	53%

N=66 for each comparison.

Interview Process

To focus our data collection effort, the research team collected and read a series of research articles about media use. Strauss and Corbin (1990) mention that while this does not allow researchers to enter the field as blank slates—a characteristic often associated with ethnographic research—it helps them have direction in their study. We used semi-structured, in-depth interviews to collect data from participants physically located in or near their work environment. We first informed the participants of the study purpose which was described as learning more about how people use technology to communication. Then we asked them to think of one of more of their current projects. The interview guide we used was based on Spradley's (1979) "grand tour type" design that seeks to both relax participants during the interview process and encourages them to share details. To accomplish this design, we began with three pre-defined questions focusing on how participants use media in their daily work. The questions were: (a) Walk me through a typical day with your job. (b) When building or sustaining customer relationships, what communication channels and technologies do you use? (c) When building or sustaining relationships with others in your organization, what communication channels and technologies do you use? While there were structured questions for every interview, our strategy, beyond getting specific answers, was to experiment with questions to produce insights about the situations (Johnson & Masten, 1998).

Phase 1 of the data collection was conducted over a five month time period in the fall of 2000 and spring of 2001. Four researchers conducted a total of 41

interviews—20 in the US and 21 in Norway. Phase 2 of the data collection occurred in the Fall of 2001. During this phase, four researchers collected a total of 25 interviews—11 in the US and 14 in Norway. The interviews from both phases lasted between 45 and 90 minutes and were audio-recorded. All the audio-cassettes were transcribed, resulting in a total of approximately 2,500 pages of double spaced text. These texts were the final documents for the U.S. interviews; however the Norwegian data set was translated into English by the primary Norwegian interviewer. The other Norwegian research team member checked these translations for semantic and contextual accuracy. Simultaneously with the interviews, we followed the standard recommendation to review the existing literature and thus validate our theoretical perspectives (Charmaz, 2000; Glaser & Strauss, 1967; Strauss & Corbin, 1990).

Content Analysis Method

Coding Framework

Content analysis is uniquely qualified as a methodology to translate qualitative observations into quantifiable form. I used the guiding framework introduced by Krippendorff (2004) as a way to create a coding scheme for analysis. I loosely modeled my categorization scheme after prior studies conducted by Ducheneaut (2002), Markus (1994), Reinsch and Beswick (1990), and Rice, McCreddie, and Chang (2001). I used an iterative coding process that ultimately resulted in mutually-exclusive codes.

While the transcripts had been coded for prior research, I determined that this study required me to re-code every interview. Because of the scope of this project, I

chose to use N6 (formerly Nudist) software from QSR International to help me organize my coded data. N6 is a qualitative software package that allows researchers to import text documents, develop a variety of coding approaches, and easily generate reports in each coding category. For this project, N6 was particularly useful because it allowed me the flexibility to both pre-define theoretical coding categories, and to add new ones as they emerged in the data. N6 also links the codes directly to the verbatim text. In this project, not only did this feature help during coder training, but it also allowed me to generate examples that further explain my quantitative results.

But before I began coding in N6, I needed to return to the important premises of content analysis. The coding process included searching for a theoretically meaningful unit of analysis, creating the coding scheme, and developing coding reliability. What follows is a detailed account of that process.

Coding

Rules for unitization. Krippendorff's (2004) approach to content analysis focuses on finding a theoretically meaningful unit of analysis that is also capable of reliable coding. To meet both of these criteria, I found that sentences were both meaningful and clearly definable as a coding unit. I also considered choosing *words* from the transcripts but that is clearly too brief because it does not allow for coding into each of the three main categories without looking at the broader context. Paragraphs were another possibility, but they typically contained multiple mentions of media, influences, and uses. Therefore, sentences seemed most appropriate.

Creating an analytical construct. When creating a coding scheme, Krippendorff (2004) explains that not only do researchers need to make inferences from the data, but those decisions should be justifiable by demonstrating a thorough understanding of the “stable factors in the system of interest” (p. 261). This process involves creating an analytical construct; that is, formulating a theory of the relatively stable data-context relationships. This is one of the most challenging decisions that I made in this study because there is so much data that provides context beyond the scope of my research questions and hypotheses. This is what my prior literature review has accomplished. Tables 2.1 and 2.2 (from chapter two) represent the compilation of theoretical and empirical literature that forms the basis for my coding document.

With that in mind, the theoretically-driven framework that I developed in chapter two contains three overarching categories that helped me address my research questions: media use, reasons for use, and influences on use. I also carefully defined each subcategory of these three main categories because they provided the guiding rules used for making coding decisions.

Coding document. Appendix B provides the final coding document, which used a combination of theoretically-derived categories, participant-mentioned media, and interrater coding reliability concessions to arrive at this final scheme. Each unit of analysis was examined according to the three overarching content categories: medium used, influences, and reasons for use (see Figure 1.1).

In the model, the medium content category is divided into discrete and combinations of media. In the actual coding document, the discrete category consisted

of 16 distinct discrete media and the combinations category consisted of 45 categories (see Appendix B for operationalizations of the main media categories; see Table 3.2 and 3.3 for the final distributions in each category).

Table 3.2

Frequency of Discrete Media

Medium	% Discrete media	% in Data Set
Web	36.8 %	30.5 %
Email	19.5	16.1
FtF	13.9	11.5
Computer	7.5	6.2
Paper	5.5	4.5
Telephone	4.2	3.4
Intranet	3.7	3.1
Web conference	1.9	1.6
Newsgroup	1.3	1.1
PDA	1.2	.95
Database	1.1	.95
Mobile Phone	1.1	.89
Fax	.78	.64
Voicemail	.58	.48
Videoconference	.50	.41
Two-way pager	.48	.39

N in discrete media = 3,990; N in dataset = 4,826

Table 3.3

Frequency of Media Combinations

Medium	% Media Combinations	% in Data Set
Web then FtF	12.1 %	.97 %
Complex sequence	10.8	.87
Computer then Web	8.0	.64
FtF then Email	6.7	.54
Web then Computer	6.4	.52
Email then FtF	4.6	.37
Email then Telephone	4.6	.37
Web then Telephone	4.1	.33
Web then Email	3.6	.29
FtF then Web	3.6	.29
Web then Paper	2.8	.23
Telephone then Email	2.6	.21
FtF then Telephone	2.3	.19
FtF then Paper	2.3	.19
Web then PDA	2.1	.17
Email then Web	2.1	.17
Paper then FtF	1.8	.15
Paper then computer	1.8	.15
Computer then FtF	1.6	.12
Web then Database	1.3	.10
FtF then Newsgroup	1.0	.08
Email then Paper	1.0	.08
Email then PDA	1.0	.08
Paper then Fax	1.0	.08
Email then Computer	.77	.06
Paper then Web	.77	.06
Web then Fax	.52	.04
Telephone then FtF	.52	.04
Mobile phone then Computer	.52	.04
Mobile phone then Email	.52	.04
Intranet then telephone	.52	.04
Paper then telephone	.52	.04
Paper then FtF	.26	.02
Computer then Email	.26	.02
Email then Mobile telephone	.26	.02
Web then Newsgroups	.26	.02
Web then Intranet	.26	.02
Telephone then Computer	.26	.02
Telephone then Intranet	.26	.02
Intranet then Email	.26	.02
Intranet then Web	.26	.02
Fax then Email	.26	.02
Paper then Email	.26	.02
FtF then Database	.26	.02

$\bar{N} = 388$ for combinations of media, N in dataset = 4,826

This level of coding detail was needed to provide answers to the questions addressed in this research. It also clearly distinguishes this research because the media studied are the specific media mentioned by the study participants, so the media category is highly inclusive.

Next, each unit of analysis was coded into the *reasons for use* category. The final category set that was reliably coded contained seven reasons: *Information*—getting it, giving it, learning, problem solving; *Persuasion*—influencing, controlling, or actively managing impressions with others; *Documentation*—documenting communication or providing written organization to communication; *Social*—being social with others in a work context; *Entertainment*—being entertained or entertaining oneself in a work environment; *Multiple Uses*, and *Other Uses*. See Table 3.4 for the frequency distribution of these uses.

Table 3.4

Frequency of Reasons for Use

Reason	% Found in Dataset
Information	62.7%
Persuasion	21.7
Documentation	10.3
Social	2.4
Entertainment	2.2
Multiple Uses	.8

N = 4,706

The influences category contained five categories that could be reliably coded. The five categories included: (a) media traits (physical considerations perceived to be affixed to the medium itself), (b) social influences (using media because others do), (c) individual preferences (using media because a person likes the medium), (d) multiple influences, and (e) other influences. See Table 3.5 for an overview of each category.

Table 3.5

Frequency of Influences

Influence	% Found in Dataset
Media Traits	79.8%
Social Influences	11.3
Individual Preferences	8.6
Multiple Influences	.2
Other Influences	.07

N = 4,278

Reliability Considerations

Considering the scope of this project, the desire to code all 24,152 sentences in the transcripts, and the need to establish reliability of the coding, I solicited the help of an additional coder. After initial training, described below, this coder examined a random sample containing one third of the remaining transcripts and coded them at the sentence level. I coded two-thirds of the remaining transcripts.

Because this data was collected under a broader research question, the first step was to narrow the 24,152 units of analysis down to the ones that discussed specific media use. This narrowing was important because in some interviews the units of analysis contain conversations that simply provide context—i.e., demographic data and recounts of organizational experience—and these do not meet the coding requirements for this study. In addition, many of the 24,152 sentences contain comments by the interviewer. It was important in this study to focus exclusively on the interviewee, and only on sentences that mentioned media use. This resulted in a reduction to 6,028 qualifying units of analysis. The interview data coded represented 25% of the total number of sentences in the interviews. Furthermore, as mentioned in the next section discussing the creation of coding categories, 8.5% of the 6,028 units were coded into the general category, meaning that the coders could not tell if a specific medium was mentioned. The interviewees mentioned how a medium should not be used in 11.8% of the coded data, and they mentioned how others use a medium in 12% of the coded data. These three categories were not included in any analyses for this study because they did

not contribute theoretically. This means that 4,448 units of analysis mentioned a specific medium and were applicable for this study.

This reduction process occurred concurrently with the coding training, actual coding, and reliability checks. I use both the Holsti (1969) reliability calculation and the pi (Scott, 1955) method that adjusts for coder agreement resulting strictly by chance. I used the recommendations of Wimmer and Dicktrich (1994) of achieving a reliability coefficient of 90% or greater using Holsti's calculation and greater than .75 when using the pi method. Next I will describe the interrater reliability training and check process in detail.

The coders achieved acceptable initial intercoder reliability through a multi-step process. First, I took the complete theoretically developed coding scheme—containing the categories of media, influences, and uses—and trained a second coder on the definitions. We also coded one interview together as initial training. Second, the two coders individually coded three interviews then came together to compare the results. The reliabilities were considered unacceptable at the unit of analysis identification level and in all three categories (u.o.a = .40, media = .55, influences = .52, uses = .33). We then reviewed those interviews to achieve complete agreement and modified the coding scheme. We individually coded two more interviews and they were also unacceptable (u.o.a = .72, media = .78, influences = .55, uses = .60), so we reviewed those interviews to achieve complete agreement and simplified the coding scheme again. A detailed explanation of where we differed on each of the categories is found in the next section of this document. We trained again on two interviews by coding together. At this point

we independently coded three interviewees and achieved acceptable intercoder reliability u.o.a = .86, media = .92, influences = .81, uses = .82. That reliability held at a mid-point check—after 24 interviews were coded—with u.o.a = .83, media = .91, influences = .83, uses = .88 and our final reliability check u.o.a = .92, media = .93, influences = .78, uses = .79. At each of those check points, 6% of the interviews were double coded. Overall, 22% of the entire dataset was double coded. Twelve percent of the interviews were double coded during the mid and final reliability checks. The remaining ten percent were double coded during training for the purpose of achieving reliable coding. All interviews used for reliability checks were randomly selected.

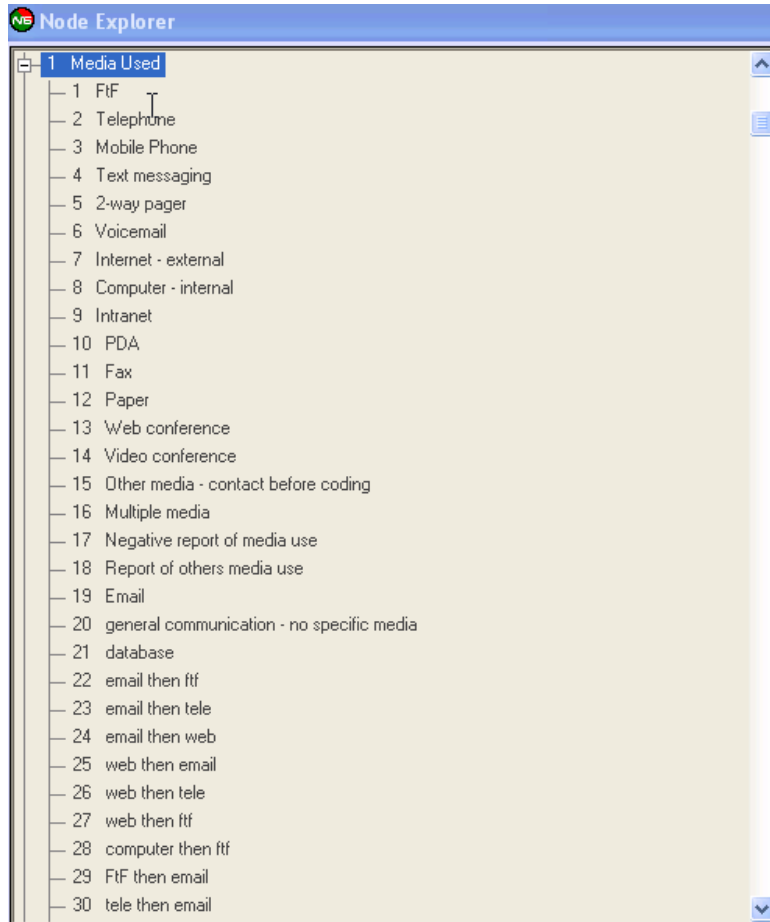
I did not use the interrater reliabilities inside N6 to perform these calculations. Instead I printed copies of both coders' data and did a manual calculation. This was to avoid potential problems as data is merged. There were also slight deviations between the two coders in the sentence numbering of several interviews. These were never off more than one sentence and for that reason, I applied a one sentence tolerance for all the reliability calculations. This is more conservative than the options available in N6. To explore how the coding scheme and definition modifications developed, I will next explain each coding category separately.

Process for the Media Category

Creating the subcategories in media was a straight-forward process. During training, the two coders simply added the media, mentioned by the interviewees, to the “Media Used” category in N6 (see Figure 3.1).

Figure 3.1. Screenshot of N6 List of Media Codes.

This is a screenshot of the first 30 media codes that were developed from the data.



This process closely honored one objective of this study, allowing the media to emerge and not be pre-defined before the study. After coding one interview together, there was a list of 30 different media codes. Both coders agreed that as the independent coding continued they would each add codes to their databases and those would be checked for agreement.

Upon completion of the three initial-reliability-check interviews, I compiled a confusion matrix to help the coders see where we disagreed. A confusion matrix lists all the coding options for one coder along a horizontal axis and then lists those same coding options for the other coder along a vertical axis. If both coders achieve complete agreement, a diagonal line is produced. All deviations from that diagonal provide information about how the two coders differ—that is, the extent to which, and location of, any categories that are “confused” by the coders. This confusion matrix showed very little disagreement about discrete media, because people typically mentioned the specific media they used. Disagreement centered on four types of codes: when the interviewee did not mention a specific media, when the interviewee spoke of how others used media, when interviewees spoke negatively of how they used media, and when combinations of media were mentioned. I decided to create a specific code for each of these four areas. Instead of trying to infer what medium people used, when a medium was not specifically mentioned it was coded into general communication. There were also categories for others’ use of media and negative use of media. I felt that these were theoretically different media usages than when people report positively on how they use media. Finally, any time people mentioned (a) that they used media in sequence, or (b)

that two different media were equivalently used for the same purpose, those were coded into the multiple media category.

Because media combinations are the focus of this study, at the completion of all the initial coding, the multiple media subcategory was re-coded. Once again both coders trained on 10% of the multiple media codes and then I coded the remaining 90% of the codes. This time, I gave every sequence mentioned a unique code so I could track the specific types of sequences. This resulted in 48 new codes that represented unique sequences. Examples of these new codes include: FtF followed by email, the Web followed by the telephone, and the computer followed FtF. In addition, there was a category called “complex sequences” that reflected all sequences where more than two media were mentioned. When people said that two media were basically equivalent—e.g., I use FtF or the telephone when I need to convey emotion—that remained in a multiple media code and was not considered a combination. Upon completion of this coding, a random sample of 10% of the re-coded multiple media category was coded by both raters. Final reliability was .91.

Process for Reasons for Use

Early in the training process, the two coders realized that the theoretically developed list of reasons for using media was very complex. In some cases, we could not reach clear definitions as to the codeability of a category. For example, theoretically the idea of coding for bringing closure to a task is interesting, but as we searched through transcripts to provide example of how to define this, we found that people do not say they are bringing closure to a task. Therefore, there was considerable discussion

about how to create definitions for categories that are meaningful as we coded natural language.

After coding one interview separately for training and creating a confusion matrix, we quickly determined that getting information, sharing information, following up, learning, and problem solving were indistinguishable at the sentence level. While these can clearly be separated when using a method such as a questionnaire, in natural language people do not articulate the details. Originally we wanted to distinguish between bonding to feel less lonely, involving others, and maintaining relationships, but ultimately these were combined into the social category. Persuasion reasons also combined to contain controlling others, negotiate, influence others, or impress others. Entertainment combined the categories of play, relax, and leisure. Documentation contained the categories of documenting, being redundant, organizing written information and creating audit trails. By combining these categories, we were able to eventually reach the interrater reliabilities reported previously.

I also removed the same three categories mentioned in influences: “reasons resulting from negative use,” “report of reasons for others’ use,” and “influence explained in next.” I used the same logic that the first two categories were already coded in N6 under media; therefore, additional coding here added no value. The final category, “influence explained in next sentence,” was also confusing in this category. We resolved this disagreement by agreeing that when the reason for use is clearly discussed in the next sentence, place that unit of analysis into the appropriate reason for

use category. We further agreed that if there was no reason for use mentioned, we would not code anything for that unit of analysis in this category of codes.

Process for Influences

Achieving reliability for the influences category was fairly quick. There were fewer theoretical categories, yet at first the definitions were not clear enough to achieve reliability. I modified the definitions to align more closely with physical characteristics of the medium. This is similar to media richness views that view each medium as having specific characteristics that make it more or less appropriate for a given situation. These include things like portability, ability to review and reprocess information, and reaching others quickly.

Social influences were clearly distinguished because these were external forces, like other people, influencing how media is used. This includes social influence theory-related considerations like coworkers influencing use.

Individual differences were internal forces, like personal preferences concerning a medium. This variable does not specifically align with any theories of media use, but it often included in media use models (e.g., Sitkin et al., 1992).

In addition to clarifying definitions, I also removed several categories that did not relate theoretically to the coding. Specifically, I removed the categories, “influences resulting from negative use,” “report of an influence on others’ use,” and “influence explained in next.” I decided that the first two categories were already coded in N6 under media; therefore, additional coding here added no value. The final category, “influence explained in next sentence,” was originally included to provide a context

clue during analysis. But this was confusing to the coders and it would add an additional step to each analysis where this was the influence coded. The coders resolved this difference by agreeing that when the influence is clearly discussed in the next sentence, place that unit of analysis into the appropriate influence category. We further agreed that if there was no influence mentioned, we would not code anything for that unit of analysis.

Summary of Data Collection & Coding Procedure

This study was designed to collect rich data using interviews with experienced media users and then subsequently convert that data into numerical counts. To accomplish this I used an existing dataset and relied on theory to help establish my coding scheme. As expected, the coding scheme began with many categories and though the interrater reliability realizations, it was simplified. This simplification allowed the coders to code the interviews reliability and still retain much detail, especially with respect to the vast media used in organizations today. The next part of this paper discusses some steps needed to convert count data into variables useful in answering my research questions

Data Conversions

Binomial to Continuous

There are two aggregated levels of data discussed in the following analyses. At the raw data level, each unit of analysis ($N= 6,028$) was coded in the software program N6 from QSR International. At this level, each unit of analysis was coded into one of the 70 categories of discrete or multiple media, up to one of the five categories of

influences, and up to one of the seven categories of reasons for use. This satisfied the content analysis conditions for mutually exclusive and exhaustive categorical coding. While in theory this created a large binomial data set, it is difficult to retrieve binomial data from N6.

What is retrievable from N6 is frequency data that is grouped by either person or specific categories. I chose to export a series of reports from N6 that aggregated data by person and by category. In the process, all the units of analysis for a given person—24 to 309 depending on the interviewee—were summed for each of the 82 categories. This means that if a person mentioned the Web in 12 units of analysis, he or she received a 12 for his or her score in the Web media used category. If that same person said that media traits influenced him or her in 36 units of analysis, that person received a 36 for his or her score in the media traits influence category. This gave each interviewee a continuous-level variable score on each category which was used for subsequent analyses such as regression.

Compensating for Interview Length

In the inferential statistical analyses that follow, the sample size is typically 66 – that is, the number of respondents. Furthermore, because the interviews varied in the number of coded units of analysis ($M = 91.3$, range of 24-309; see Appendix A for more details listed by interviewee), I determined that giving each interview equal weight compensated for the discrepancy in the numbers of contributed codes (see Putnam et al., 2005 for a similar example). For this reason, each of the coded categories was converted to a percentage to allow equal weighting for each interviewee. For

example, if one interviewee was verbose and mentioned how he used media 100 times, and another interviewee only mentioned how she used media 25 times, the verbose interviewee's comments did not count four times more than the those of the reserved interviewee. The summation scores mentioned above on each category were divided by the total units of analysis for that interviewee to compensate for varying interview lengths.

Variable Considerations

The normal distribution of outcome variables is another consideration for this data. Both of the key outcome variables underwent transformations to achieve more normal distributions. Furthermore, because the relationships in the model are quite possibly bi-directional, I examined all the predictor variables for normal distribution as well. Many of these variables also underwent transformations to achieve a more normal distribution. Details of these transformations are addressed with each major variable.

Aggregating All the Interviews

Because of the diversity in this data, I also checked to see if the demographic and organizational variables caused the groups of interviewees to behave differently. To facilitate this test, I ran a series of t-tests and found no significant differences between groups (See Table 3.6) on discrete or combinatorial media use.

Table 3.6

Summary of T-Tests of Demographic Variables

Variables	Combinatorial Media Use				Discrete Media Use		
	N	M	SD	t	M	SD	t
Gender							
M	47	.27	.15	1.3	.70	.22	-1.1
F	19	.22	.17		.77	.24	
Org. Size							
Big	38	.27	.14	.61	.71	.21	-.31
Small	28	.24	.17		.73	.24	
Org Business							
Product	37	.27	.17	.47	.70	.25	-.72
Service	29	.25	.13		.74	.19	
Manager Status							
Manager	24	.27	.17	.44	.69	.24	-.74
Non-manager	42	.25	.14		.74	.22	
Job Role							
Ext	37	.26	.17	-.14	.72	.25	-.26
Int.	29	.26	.13		.72	.19	
Nationality							
U.S.	31	.24	.18	-1.1	.74	.26	.75
Nor.	35	.27	.13		.70	.20	

N = 66 for all comparisons
df = 64 for all comparisons

Variables

Primary Outcome Variables

The primary outcome variables in this study are reflected in the overall model: discrete media use and combinatorial use. In addition, because this study specifically examines combinations of media, I am also interested in the media used discretely and, in the case of combinations, those media named second after a first medium is named.

Discrete media use. This variable measures the percent of all media mentioned by a person that are discrete media. In this study there were a total of 16 categories of discrete media that people used. To create this variable, I summed the 16 categories of discrete media and divided by the total media used—a sum of the discrete and combination of media used. This variable underwent a cubed transformation to achieve a normal distribution and a $M = .72$, $SD = .22$.

Combinatorial use. This variable measures the percent of all media mentioned by a person that are combinations of media. In this study there were a total of 45 categories of combinations of media that people used. To create this variable, I summed the 45 categories of combinations of media and divided by the total media used—a sum of the discrete and combination of media used. This variable underwent a square root transformation to achieve a normal distribution. The resulting $M = .26$ and $SD = .15$.

Media used second in a combination. There were many media used second in this study, but to limit the complexity I chose to focus on the six most frequently used second media: FtF, Web, email, telephone, computer, and paper. All six of these

variables were first converted to a percent of media used second—each medium used second divided by a sum of all combinations of media used second—to adjust for variability in interviewee contribution. All six variables underwent squared transformations and their resulting means and standard deviations are as follows: FtF second $M = .15$, $SD = .25$; Email second $M = .23$, $SD = .32$; Web second $M = .13$, $SD = .25$; Telephone second $M = .13$, $SD = .21$; Paper second $M = .09$, $SD = .21$; Computer second $M = .05$, $SD = .16$.

Media used discretely. While my interest is primarily in media combinations, knowing how the discrete media are used provides an important comparison point. The six media used most frequently when named discretely, were also the six most frequently mentioned media-used-second. All six of these variables were first converted to a percent of media used discretely—each medium used divided by a sum of all media used discretely—to adjust for variability in interviewee contribution. Five of the six variables underwent squared transformations. Use of the Web was normally distributed without a transformation. Their resulting means and standard deviations are as follows: FtF $M = .35$, $SD = .15$; Email $M = .38$, $SD = .19$; Web $M = .38$, $SD = .17$; Telephone $M = .15$, $SD = .14$; Paper $M = .17$, $SD = .16$; Computer second $M = .19$, $SD = .18$.

Complex combinations of media. The final outcome variable contains the combinations that reflected more than two media mentioned in a sequence. This variable was found in only 17 of the 66 interviews and underwent a fourth root

transformation to achieve close to a normal distribution. The resulting $M = .23$, $SD = .36$.

Primary Predictor Variables

Information reasons. This variable is the first of five reasons-for-use predictor variables examined in this study. This variable was first converted to a percent of all reasons used—information divided by information plus documentation plus persuasion plus social plus entertainment—to adjust for variability in interviewee contribution. This variable was normally distributed and had a $M = .64$ and $SD = .19$.

Documentation reasons. This variable is the second of five reasons-for-use predictor variables examined in this study. This variable was first converted to a percent of all reasons used—documentation divided by information plus documentation plus persuasion plus social plus entertainment—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .25$ and $SD = .17$.

Persuasion reasons. This variable is the third of five reasons-for-use predictor variables examined in this study. This variable was first converted to a percent of all reasons used—persuasion divided by information plus documentation plus persuasion plus social plus entertainment—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .42$ and $SD = .23$.

Social reasons. This variable is the fourth of five reasons-for-use predictor variables examined in this study. This variable was first converted to a percent of all

reasons used—social divided by information plus documentation plus persuasion plus social plus entertainment—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .08$ and $SD = .14$.

Entertainment reasons. This variable is the final reasons-for-use predictor variables examined in this study. This variable was first converted to a percent of all reasons used—entertainment divided by information plus documentation plus persuasion plus social plus entertainment—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .06$ and $SD = .12$.

Media traits. This variable is the first of three influence predictor variables examined in this study. This variable was first converted to a percent of all influences used—media traits score divided by media traits plus social influences plus individual differences—to adjust for variability in interviewee contribution. This variable then underwent a squared transformation to achieve a normal distribution and a $M = .65$ and $SD = .26$.

Social influences. This variable is the second of three influence predictor variables examined in this study. This variable was converted to a percent of all influences used—social influences score divided by media traits plus social influences plus individual differences—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .32$ and $SD = .15$.

Individual differences. This variable is the final influence predictor variable examined in this study. This variable was converted to a percent of all influences used—individual differences score divided by media traits plus social influences plus individual differences—to adjust for variability in interviewee contribution. This variable underwent a square root transformation to achieve a normal distribution and a $M = .21$ and $SD = .23$.

Analysis

To answer the research questions and hypotheses for this study, I used several different statistical analyses and descriptive data. First I will provide general information on the specific statistical tests used. Then, since each of three major categories in the research model forms the basis for a set of research questions, I will provide an analysis overview of each one. I will also separate the questions exploring combinations in detail because they are more exploratory and they are important for our developing understanding of combinations of media use. For all analyses, I pre-determined the significance level of these tests to be .05, but I will also report results significant up to the .1 level because this research is descriptive in nature, and because the sample size is so small. Knowing that some tests approach significance might help in future research.

Testing for Differences between Groups

When the analysis method called for comparing two groups of interviewees on a single dependent variable, a t-test was performed. This was typically comparing two groups of organizational influence variables. Prior to each test I checked the dependent

variable for a normal distribution and transformed it if necessary. In each case I checked the Levene's test for equality of variances and chose the appropriate t value and significance level. As mentioned previously, .05 two tailed significance was pre-established, but up to .1 is reported as marginally significant.

Testing for Relationships between Parts of the Model

Relationships between one or more continuous-level predictors and a continuous-level outcome measure were analyzed using a linear regression analysis. Prior to each test I checked the dependent variable for a normal distribution and transformed it if necessary. I also examined the error residuals to verify that they met the homogeneity in error variance assumption. Finally, I checked the Pearson correlation coefficients to anticipate any multicollinearity issues between my predictor variables. In several situations this was a concern and I address this by transforming the predictors or by including only one of the highly correlated predictors into the model. Details of these deviations are provided with each applicable result.

Testing for Differences Among Categories

Several research questions ask if there are differences in how the influences and reasons are distributed across the specific media. These analysis are more descriptive, yet content analysis is particularly well suited to identify patterns and communication structures (Krippendorff, 2004). The relevant statistical test for uncovering the significance of these distribution differences is a chi-square. Fortunately, this test uses count data, so my N will be considerably larger than in the predictive relationship analyses. Having a large sample size matters because most scholars agree that there

must be at least five observations in each category to avoid type II errors that can occur when conducting a chi-square analysis (Wimmer & Dominick, 1994).

Categorizing and Determining Similarity between Variables

One of the main goals of this study is to determine how media—particularly combinations of media—group. This is important because it will simplify explanations of media use. Having a long laundry list of specific combinations is nice, but too complex to be tested in the future. To accomplish this goal, I used three different analyses: factor analysis, hierarchical cluster analysis, and multidimensional scaling. The use of these multiple data reduction methods should help add to the validity of the results (Barnett & Danowski, 1992; Flanagin & Metzger, 2001; Rice & Richards, 1986). I will describe each of these techniques below to better explain the assumptions I made in these tests.

Factor analysis. As a first step for each of the data reduction questions, I used the factor analysis function found in SPSS. In all cases I used a principal components extraction with varimax rotation. To determine the factor solution, I examined the scree plot for the point where the curve flattens out, and compared that to the displayed factor loadings. I used a loading criterion of greater than .6 to decide the final factor solution.

Hierarchical cluster analysis. Several of these research questions ask about identifying similarities among categories in my model. When this is the goal, methods like cluster analysis are appropriate (Perse & Courtright, 1993; Rice, 1993, Rice & Richards, 1985). These data were analyzed using a hierarchical cluster procedure. It began with a similarity measure of squared Euclidian distances—a procedure that treats

each observation as a cluster and then systematically groups those that are most similar. There are several ways to calculate the inter-group distances, and I chose the between-groups criterion because it is a simple linkage and calculates the distances between the closest neighboring points. If this calculation had not differentiated between the groups, I would have tried other methods—e.g. a complete linkage with furthest neighboring groups. This is an exploratory method that is atheoretical and only seeks to minimize within-group variation and maximize between group variation. First, I examined the between-cluster distance coefficients. This measure examines cluster differences at contiguous stages and compares them on magnitude. The challenge is to examine these differences and identify meaningful clusters. Sometimes extreme solutions that group all items together might exist, but lack discriminatory information. Because there is no absolute measure to determine which distance ratios are significant, a commonly used criterion is theoretical relevance (Flanagin & Metzger, 2001; Rice & Richards, 1985), which formed the basis of my second criterion. I used the hierarchical cluster analysis program contained in SPSS version 11.

Multidimensional scaling. The final classification method I used was multidimensional scaling (MDS). This technique uses a correlation matrix of the variables to construct a visual representation of how the variables relate spatially. The goal of the technique is to minimize the number of classification dimensions and maintain agreement in the proximities of the individual variables being located in an n-dimensional space (Rice & Richards, 1985). The result does not identify clusters. It is dependent on another technique, such as hierarchical clustering analysis, to group objects

within this multidimensional space, and then on the researcher to determine how the spatial placement makes sense theoretically (Rice & Richards, 1985).

Factors Affecting Media Use

Reasons and Media Use

The first set of factors affecting media use contains the reasons people use media. I am not making absolute causal claims, but it is likely that the reasons people need to use media to communicate affect the media they use. There were five categories of reasons for media use that were coded: information, documentation, persuasion, social, and entertainment. As mentioned previously in the literature review, we have data that links some reasons for use and specific media (e.g., Flanagin & Metzger, 2001). These study questions take that knowledge into account and they expand into the realm of combinations of media.

H1: Across all media, information purposes are the most frequently stated reasons to use media.

H2: The Web will be the top media used to get information.

H3: Experienced organizational members will use discrete media for social, play, leisure, and insight reasons.

RQ1: What reasons do experienced organizational members give for using media combinations?

The following table outlines how these questions were analyzed:

Table 3.7

Analyzing Questions Relating Reasons for Media Use

Hypothesis/Question	Analysis
H1	Frequency Report
H2	Frequency Report
H3	Regression
RQ1	Regression

This second set of questions centered on the relationship between influences and media use. While I do not have experimental data to make claims that influences cause media use, it is plausible that media are used because of one or more of the following three influences: media traits, social influences, and individual preferences.

Furthermore, demographic and organizational variables might influence media use, so they are included in this section as well. As mentioned in chapter two, the specific questions I address in this study are listed below:

RQ2: What influences people to use media?

H4: People who consider media traits are more likely to use media combinations.

RQ3: Which of the influence categories predicts discrete and combinatorial media use?

H5a: People in interorganizational job roles are more likely to use combinations of media than those in intraorganizational job roles.

H5b: Managers are more likely to use combinations of media than are non-managerial knowledge workers.

H5c: U.S. workers are more likely to use combinations of media than those from Norway.

The following table outlines how these questions were analyzed:

Table 3.8

Analyzing Questions Relating Influences on Media Use

<u>Hypothesis/Question</u>	<u>Analysis</u>
RQ2	Frequency Report
H4	Regression
RQ3	Regression
H5a	T-test
H5b	T-test
H5c	T-test

Reasons and Influences

The relationship between reasons why people use media and the influences on media use is a relatively unexplored linkage. But it is important for model development to know if the same influences on media might also affect the reasons for use.

Furthermore, several of the organizational context influence variables are likely related to reasons for use. For these reasons, I proposed the following questions:

RQ4: Are the various reasons for use affected by different influences?

H6: People in interorganizational job roles will use media for persuasion more often than people in intraorganizational job roles.

RQ5: Are managerial status and national culture associated with reasons for media use?

Table 3.9

Analyzing Questions Relating Reasons and Influences

Hypothesis/Question	Analysis
RQ4	Chi-Square
H6	T-test, Frequency
RQ5	T-test, Frequency

Understanding Combinations in Detail

The last set of questions allows us to delve more deeply into the combinations of media that were identified from the interviews. In these combinations, most (328) contained sequences of two media mentioned. The remaining 42 were called “complex sequences” because they involved more than two media.

Prior to this section of questions, my outcome variables have been the consolidated measure of discrete or combinatorial. Here, I examine the specific discrete media and the specific combinations. It is also important to consider that the media mentioned first in a combination may or may not be used or influenced differently than when that same medium is mentioned in isolation. But what the media mentioned second have in common is that they all follow an initial medium. For this reason, I am particularly interested in focusing on the medium used second. The second half of these questions allow me to explore this and compare it to media used discretely.

RQ6: Do the reasons for using media vary across the specific discrete and combinatorial media?

RQ7: Do the influences vary across the specific discrete and combinatorial media?

RQ8: By examining media used second in a combination, what do we learn about (a) media used second in general, (b) second media use and influences, and (c) second media use and reasons for use?

RQ9: How are complex sequences different from combinations and discrete media with respect to influences and reasons for use?

Table 3.10

Analyzing Questions Regarding Specific Combinations

Hypothesis/Question	Analysis
RQ6	Frequency, Chi-Square
RQ7	Frequency, Chi-Square
RQ8	Frequency report, factor analysis, cluster analysis, MDS, regression
RQ9	Frequency report, regression

Research Methods Chapter Summary

This chapter explained the data collection and analysis procedure I used for this study. My approach is different from many media use studies because I quantified interview data. In the process I allowed the participants flexibility to mention any medium they used. The analyses I used were diverse and designed to answer my theoretically driven research questions. Now that I have explained my methodological approach, I will focus on the results in chapter four.

CHAPTER FOUR: RESULTS

This chapter focuses on presenting the results of the analyses, organized around each of the three sets of relationships: reasons for media use, influences on media use, and the associations between influences and reasons for use. As mentioned in the previous chapter, I do analyze the data at two levels: by interviewee ($N = 66$), and by coded unit of analysis (N varies by category, but is generally approximately 4,500). To increase the clarity of these distinctions, all tables include an N or a degrees of freedom report. I spend the bulk of this chapter showing the results of several analyses designed to help me understand the phenomenon of combinations of media use at a deeper level.

Overall the results support previous work on reasons to use discrete media and they further show that the aggregate measures of discrete and combinatorial media use are predicted by several of the reasons for use variables. Specifically, entertainment reasons predict discrete media use and combinatorial media use is predicted by persuasion and documentation reasons. There are also relationships between influences and reasons people use media in two organizational variables: job role and nationality. When examining specific discrete media and media combinations, both the reasons for use and the influences on use vary across the specific media. Finally, there are patterns to how media group when they are used second in a sequence.

Reasons for Use of Media

The research questions and hypotheses addressed in this part of the results first test the existing findings concerning discrete media use. Then, the focus is on uncovering the relationships between the dichotomous outcome variable of discrete or

combinatorial media use. Relating the reasons for use to specific media or media combinations is covered in a later section of the results.

Hypothesis 1

The first two hypotheses were derived from Flanagin and Metzger's (2001) uses for media study. Hypothesis one said that across all media, information reasons are the most frequently stated reasons to use media. This hypothesis was supported using frequency data. There were 4,706 units of analysis that were coded into reasons for use categories. Of those, 63% of the time, media is used for information reasons, 22% for persuasion, 10% for documentation, 2% for both social and entertainment reasons, and 1% of time it is used for multiple reasons.

Hypothesis 2

Hypothesis two also sought to confirm Flanagin and Metzger's (2001) findings that the Web is the top medium used to get information. The findings from study support that hypothesis by examining frequency data. Forty one percent of the time that information is the reason for use, the Web is used. This is followed by email, which is used 16% of the time when information is the reason for use.

Hypothesis 3

This hypothesis claimed that experienced organizational members will use discrete media for social, play, leisure, and insight reasons. As mentioned previously in the methods sections, in this study play and leisure were combined into entertainment and insight was not coded. So I tested the prediction that discrete media were used for social, and entertainment reasons through a regression. The model was significant with

$R = .30$, $R^2 = .09$, $F(2, 65) = 3.2$, $p < .05$. Entertainment reasons ($\beta = .27$, $p = .03$) was the only significant predictor for discrete media use. Thus, hypothesis three was partially supported with social and entertainment reasons accounting for 9% of the variance in discrete media use. Because social reasons were not significant, I re-ran the model using only entertainment as the predictor. This was significant, $R = .27$, $R^2 = .08$, $F(1, 65) = 5.1$, $p < .05$. Entertainment reasons account for 8% of the variance in the choice of a discrete medium.

While the hypothesis was partially supported, both entertainment and social reasons only accounted for 9% of the variance, so I decided to see if including other reasons could increase the explanatory power of the model. Examination of the correlations between the predictors indicated a considerable negative correlation between information and persuasion uses, $r = -.81$. For this reason, two regressions were run each including only one of the correlated predictors. Both regressions were significant with the best model resulting when persuasion was included in the model and information was excluded. In the first model, when information, documentation, social, and entertainment reasons were included, $R = .41$, $R^2_{adjusted} = .11$, $F(4, 65) = 3.0$, $p < .05$. Information reasons ($\beta = .24$, $p = .06$) and entertainment reasons ($\beta = .28$, $p = .02$) were significant positive predictors for discrete media use. In the second significant model, with persuasion, documentation, social, and entertainment reasons included, $R = .40$, $R^2_{adjusted} = .11$, $F(4, 65) = 2.9$, $p < .05$. Here, entertainment is the only significant individual predictor for discrete media use ($\beta = .24$, $p < .05$). One other predictor was marginally significant. Persuasion negatively predicted discrete media

use ($\beta = -.24, p = .06$). Using the fact that documentation and social reasons were not significant in this model, I re-ran the model including only persuasion and entertainment. Once again this model was significant, $R = .35, R^2 = .12, F(2, 65) = 4.4, p < .05$, and both persuasion ($\beta = -.25, p = .04$) and entertainment ($\beta = .24, p = .04$) were significant individual predictors. Persuasion negatively predicted the use of discrete media, yet entertainment positively predicted this type of use. Together, they explained 12.3% of the variance in discrete media use.

Considering that this exploratory regression improved the variance explained only slightly, and that persuasion negatively predicted the use of discrete media, it appears that the theory-driven prediction should be retained. Therefore entertainment use accounts for 8% of the variance in the use of a discrete medium.

Research Question 1

In addition to using media discretely, research question one asked about the reasons people give for using media combinations. I addressed this question using a regression analysis. As noted in the prior section, there was a considerable negative correlation between information and persuasion uses, $r = -.81$. For this reason, two regressions were run, each including only one of the correlated predictors. Both regressions were significant with the best model resulting when persuasion was included and information was excluded. When information, documentation, social, and entertainment reasons were included, $R = .39, R^2_{adjusted} = .10, F(4, 65) = 2.7, p < .05$. Information reasons ($\beta = -.24, p = .06$) and entertainment reasons ($\beta = -.25, p = .04$) were significant negative predictors for combinatorial use. In the second significant

model, with persuasion, documentation, social, and entertainment reasons included, $R = .40$, $R^2_{adjusted} = .10$, $F(4, 65) = 2.8$, $p < .05$. Here, persuasion was the only significant individual predictor and it positively predicted combinatorial media use ($\beta = .26$, $p < .05$). Two other predictors were marginally significant. Documentation positively predicts combinatorial media use ($\beta = .21$, $p = .09$) and entertainment once again negatively predicts the dependent variable ($\beta = -.21$, $p = .09$). Including only persuasion and documentation in an overall model, it was significant, $R = .34$, $R^2 = .11$, $F(2, 65) = 4.1$, $p < .05$.

Reasons for Use Summary of Results

This section of the results provided considerable information linking the relationships between reasons for using media and both the use of discrete and combinatorial media. The first two hypotheses were confirmed and found that information uses are most frequently cited for why people use media, and the Web is used most often for those information purposes. The third hypothesis was partially supported with entertainment reasons accounting for 8% of the variance in the use of a discrete medium. Finally, persuasion and documentation (marginally significant) reasons accounted for 11% of the variance in the use of a combinatorial medium.

Influences on Media Use

Research Question 2

The second research question asked in general what influences people to use media. This question was answered using frequency data. There were a total of 4,278 units of analysis that were coded in one of the influences categories. Overwhelmingly,

80% of the coded influences fell into the media traits category. This means that 80% of the time, the people in this study claimed that some physical characteristic of the medium itself influenced their media use. Eleven percent of the time, social influences, such as co-workers using similar technologies, influenced media use. Individual preferences for media influenced use 9% of the time.

To narratively illustrate how these codes appeared in actual text, I offer the following four examples of using media traits to influence media use:

“It’s always good to have a paper trail of task requests, so that, you know, there’s an auditing capability there. You can say, ‘Oh yes, I did ask you on Monday, see, here’s my email.’”

“I am in a position where I now need to reach a large number of people all at once with the same information...so I send out a blanket email.”

“I make out-of-state house calls to my big clients to just sit in front of them.”

“If you have a question, a training question, you can go there, search for whatever, search for your question, get the answer, and be able to do that task by simply looking it up on the intranet and finding out what the proper procedure is.”

Despite the predominance of the influence of media traits, social influences and individual preferences also played a role in influencing media use. Here is one example of how people expressed the social influences on their media use: “I worked there, then I worked for myself, and all of the clients that I had had Notes. So I ended up using it.” Finally, here is a narrative example of how people expressed personal preferences for using a medium. “I’ll respond by email and force them to do what I want them to do [referring to forcing others to use email to communicate because that is her preference].”

Hypothesis 4

Hypothesis four looked at the three categories of influences: media traits, social influences, and individual preferences, and proposed that people who consider media traits are more likely to use media combinations. Examining the correlation data reveals almost no relationship between these variables, $r = .08$. Regressing the percent media combinations outcome on media traits revealed an insignificant overall model $F(1, 65) = .42, p > .1$. Therefore, hypothesis four is not supported.

Research Question 3

Research question three moved beyond media traits and asked about all three influences and if they predict discrete or combinatorial media use. Regressing the percent media combinations outcome on the three influences revealed an overall model that was not significant $F(3, 65) = 2.0, p > .1$. However, two of the individual predictors were either significant or close to being significant: media traits $\beta = 1.1, p = .06$ and social influence $\beta = .77, p = .03$. Attempts to re-run the regression proved insignificant again, probably due to extreme multicollinearity between the three predictors (see the correlation matrix in Table 4.1 below). Returning to the raw variables that had not been converted to percentages and standardized across interviews also yielded insignificant findings, $F(3, 65) = 1.6, p > .1$. Finally, placing each influence into a regression model by itself also revealed insignificant findings.

Table 4.1

Correlations of Variables

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. % Media combinations	-.98**	.08	.11	-.13	-.24	.21	.24	.11	-.25*	.06	.35**	-.03	.06	.14	-.13
2. % Discrete media used	1.00	-.09	-.11	.17	.23	-.19	-.24	.13	.27*	-.05	-.35**	.03	-.04	-.14	.13
3. % Media traits		1.00	-.69**	-.81**	-.00	.22	-.15	.10	-.27*	-.15	.17	.11	-.07	-.06	.11
4. % Social influences			1.00	.18	.05	.05	.00	.05	-.04	.05	-.20	.03	.02	.19	-.18
5. % Individual differences				1.00	-.06	-.32*	.19	-.09	.43**	.16	-.04	-.20	.08	-.07	-.12
6. % Information reasons					1.00	-.17	-.81**	.06	-.09	-.13	.01	-.06	-.07	-.09	.15
7. % Documentation reasons						1.00	-.11	-.06	-.09	-.13	.01	-.06	-.07	-.09	.15
8. % Persuasion reasons							1.00	-.38	-.03	.08	.03	-.13	.04	-.12	-.09
9. % Social reasons								1.00	-.00	-.05	-.17	.08	.08	.20	-.09
10. % Entertainment reasons									1.00	.29*	-.01	-.01	-.12	-.13	.21
11. % Web as second medium										1.00	-.18	-.17	.00	.01	-.12
12. % FtF as second medium											1.00	-.27*	.04	-.08	-.16
13. % Email as second medium												1.00	-.04	-.17	-.13
14. % Telephone as second medium													1.00	-.08	-.04
15. % Computer as second medium														1.00	-.10
16. % Paper as second medium															1.00

Note. * $p < .05$, ** $p < .01$

Note. The following variables underwent a square root transformation: % media combinations, % documentation reasons, % persuasion reasons, % social reasons, % entertainment reasons, % individual differences, and % social influences. The variable % discrete media used was transformed using a cubed transformation. The following variables underwent a squared transformation: % media traits, % email as a second medium, % computer as a second medium, % Web as a second medium, % telephone as a second medium, and % paper as a second medium.

Regressing the percent discrete media outcome variable on the three influences revealed a similar pattern of insignificant results. The overall model was insignificant, $F = 1.68, p > .1$. Variations in this regression continued to provide insignificant results, though media traits as an individual predictor had a beta weight that was slightly less than .1 in one regression.

Hypothesis 5a

The next three hypotheses predict that certain organizational variables will influence the use of media combinations. The first question states that managers ($N = 24, M = .27, SD = .17$) are more likely to use combinations of media than are non-managerial knowledge workers ($N = 42, M = .25, SD = .14$). This hypothesis was not supported when tested using a t-test, $t(64) = .44, p > .1$.

Hypothesis 5b

I also hypothesized that people in interorganizational job roles ($N = 37, M = .26, SD = .17$) are more likely to use combinations of media than those in intraorganizational job roles ($N = 29, M = .26, SD = .13$). This hypothesis was not supported $t(64) = -.14, p > .1$

Hypothesis 5c

Finally, I hypothesized that U.S. workers ($N = 31, M = .24, SD = .18$) are more likely to use media combinations than those from Norway ($N = 35, M = .27, SD = .13$). This hypothesis was also not supported $t(64) = -1.1, p > .1$ While not significant, Norway did use more combinations of media than the U.S. workers. This was the opposite trend from the prediction in the hypothesis.

Summary of Influences' Results

The analyses performed above fail to identify any influence predictors of discrete media use or media combinations. However, these analyses did show us that people say that traits of the media influence them 80% of the time. I also illustrated how these influences appeared in the interview raw text. Finally, none of the hypotheses were supported that predicted how organizational variables influence either discrete or combinations of media. At this dichotomous level, influences appear to have no significant influence on the choice of either a discrete or a combinatorial medium.

Influences on Reasons for Media Use

Thus far the results have addressed questions that concern likely predictors of media use. But theoretically, it is possible that the influences affect the reasons for media use. Understanding those relationships is the goal of this set of results.

Research Question 4

Research question four asks if the various reasons for use are affected by different influences? To address this question, I ran a chi-square analysis and provided a matrix below that shows the relationships between influences and reasons (See Table 4.2).

Table 4.2

Influences by Reasons for Use Matrix

	Reasons for Use					Mean of Influence
	Info.	Social	Persuade	Entertain	Document	
Influences						
Media	84%	82%	74%	74%	81%	81%
Consider						
Social	9	15	13	2	14	11
Influences						
Individual	7	2	13	14	5	8
N each reason	2,478	104	954	63	465	

The results from the chi-square analysis show that overall, influences do vary across reasons for use, $\chi^2 = 77.26, df = 8, p < .001$. To examine these relationships more closely, I ran a contingency analysis that examined influence individually. Media traits did not vary significantly, $\chi^2 = 8.52, df = 5, p = n.s.$ Across all media, when people use media for different purposes, they claim that media traits influence them 81% of the time. The specific percentages for each reason do not vary much from the mean (range 74%-84%). However, the other two influences varied significantly. Individual preferences varied the most, $\chi^2 = 45.42, df = 5, p < .001$, followed by social influences, $\chi^2 = 23.32, df = 5, p < .001$.

Hypothesis 6

This hypothesis claimed that people in interorganizational job roles will use media for persuasion more often than those in intraorganizational job roles. This claim was supported when tested using a t-test. Those people in interorganizational job roles ($N = 37, M = .49, SD = .24$), do use media for persuasion more than people in intraorganizational job roles ($N = 29, M = .33, SD = .17$), $t(64) = 3.1, p < .01$.

In a follow-up to this analysis, I ran a series of t-tests to see if being an intraorganizational communicator was associated more with any of the reasons for using media. This test revealed that people in intraorganizational job roles ($N = 29, M = .72, SD = .15$) use media more than those in interorganizational job roles ($N = 37, M = .58, SD = .19$), for information reasons $t(64) = -3.6, p < .001$.

Research Question 5

This research question expanded the previous hypotheses and asked about the other organizational context variables—managerial status and nationality. To address this question, I ran a series of t-tests for each of the two organizational context variables across the five reasons for media use. There were several significant relationships.

First, there were two differences between the reasons people in Norway use media as opposed to those in the U.S. These tests revealed that people in the U.S. ($N = 31$, $M = .10$, $SD = .15$) use media more than people in Norway ($N = 35$, $M = .03$, $SD = .07$), for entertainment reasons $t(64) = 2.3$, $p < .05$. But when it comes to information reasons, it is a different story. Here, people in Norway ($N = 35$, $M = .68$, $SD = .18$) use media more than people in the U.S. ($N = 31$, $M = .59$, $SD = .19$) for information reasons $t(64) = -2.0$, $p < .05$.

Finally, there were no statistical differences between managers and non-managers with respect to the reasons they use media. Because this study is exploratory, I will report one difference that was significant to the .1 level. This was a differences in documenting between managers ($N = 24$, $M = .30$, $SD = .19$) and non-managers ($N = 42$, $M = .22$, $SD = .16$). Here $t(64) = 1.7$, $p = .10$.

Summary of Results for Relationships Between Influences and Reasons

There are relationships between influences and the reasons people use media. Both social and individual influences vary significantly across the five reasons for use. In addition, there were findings associated with organizational context variables and reasons for using media. People in interorganizational job roles do use media more for

persuasion than people in intraorganizational job roles. Finally, workers from Norway use media for more information reasons than those from the U.S., while U.S. workers use media for entertainment reasons more often than those workers from Norway.

Understanding Media Combinations in Detail

Thus far I have discussed the results related directly to the research model proposed in this study. I have focused on media combinations and discrete media and how their agglomerated use is predicted. But as mentioned previously, this is a high-level view, and what we see at that scale might be enhanced by looking at the specific discrete media and media combinations. In this section of the results, I first examine the more micro-level view of specific media, and then I look at more micro-level considerations of media combinations.

Research Question 6 & 7

Research questions six and seven capitalize on the fact that I have count data and that I coded being cognizant of content analysis and chi-square assumptions. Here I can use the N that is considerably larger to see more detailed relationships. Therefore, in these questions I see if (a) the reasons for using media vary across the specific discrete and combinatorial media, and (b) the influences vary across the specific media as well.

Research Question 6.

In this question I asked if the reasons for using media vary across the different media. To address this question, and still be cognizant of chi-square assumptions, I chose the ten most frequently used discrete media for this test. There were not enough cases of combinatorial media occurrences to test this for that type of use. The overall

chi-square was highly significant, $\chi^2 = 998$, $df = 54$, $p < .001$. Therefore, the reasons do vary across discrete media.

To understand this more completely, I examined the chi-square values for each of the five reasons. All of these except for entertainment ($\chi^2 = 12.75$, $df = 9$, $p = \text{n.s.}$) were significant. The significant chi-squares were for information ($\chi^2 = 135.18$, $df = 9$, $p < .001$), persuasion ($\chi^2 = 238.34$, $df = 9$, $p < .001$), documentation ($\chi^2 = 529.62$, $df = 9$, $p < .001$), and social reasons ($\chi^2 = 82.71$, $df = 9$, $p < .001$). Essentially, of the five reasons studied, documentation reasons vary the most across the ten most frequently used discrete media. This is followed by persuasion, information, and social reasons.

The frequency data show details of each discrete medium used and the distribution across the uses (See Table 4.3).

Table 4.3

Specific Media by Reasons for Use

Media	Info.	Social	Persuade	Enter.	Document	N
Web	77%	1%	15%	3%	3%	1,406
Email	61	5	14	2	19	709
FtF	43	8	46	2	1	523
Computer	26	0	24	2	48	248
Paper	76	0	7	0	17	201
Telephone	61	3	37	0	0	142
Intranet	73	1	8	0	18	138
Web conference	65	0	35	0	0	72
PDA	28	0	0	4	68	50
Newsgroups	76	0	20	2	2	49
Database	59	0	13	0	28	46
Other	56	2	21	0	18	39
Mobile phone	57	0	43	0	0	35
Fax	83	0	13	0	4	24
Voicemail	85	0	15	0	0	20
Videoconferencing	69	0	31	0	0	16

In this study, when people use the Web, 77% of the time it is for information purposes, 1% of the time it is for social reasons, 15% of the time it is for persuasion, 3% of the time it is for entertainment, and 3% of the time it is to document. This is quite different from the reasons people use FtF. This medium is used for information 43% of the time, for social reasons 8% of the time, persuasion 46%, entertainment 2% and documentation 1%. The distribution across uses for the PDA is also interesting. Twenty-eight percent of the time it is used for information, 68% for documentation, and 1% for entertainment.

While the N for combinations was not sufficient to test for variance across the five reasons, the frequency data does show some details of each media combination and the distribution across the uses (See Table 4.4).

Table 4.4

Media Combinations by Reasons for Use

Media	Info.	Social	Persuade	Enter.	Document	N
Web then FtF	63%	0%	37%	0%	0%	46
Complex sequence	50	2.5	43	2.5	2.5	40
Computer then Web	32	0	0	0	68	31
Web then computer	81	0	19	0	0	27
FtF then email	23	8	50	0	19	26
Email then FtF	67	0	33	0	0	18
Web then telephone	80	0	20	0	0	15
Web then email	86	0	14	0	0	14

The most frequently used media combination, the Web followed by FtF, is used 63% of the time for information reasons, and 37% for persuasion. When using the computer followed by the Web, a different use profile emerges. Here, this combination is only used for information 32% of the time, but it is used 68% of the time for documentation purposes.

Research Question 7

The seventh research question asked if the influences varied across the media. To address this question, I ran a chi-square analysis to see if the influences vary across the ten most frequently used discrete media, and the top five most frequently used media combinations. The most frequent media were chosen both to meet the expected count requirements for chi-square, and because they are the most theoretically meaningful. The overall chi-square was significant for discrete media use $\chi^2 = 98.65$, $df = 18$, $p < .01$; and it was also significant for media combinations, $\chi^2 = 20.97$, $df = 8$, $p < .01$.

To examine these relationships more closely, I ran a contingency analysis that examined each of the three influences individually. The chi-squares revealed that media traits do not vary across the specific discrete media, $\chi^2 = 10.64$, $df = 9$, $p = \text{n.s.}$, or across the specific media combinations, $\chi^2 = 2.50$, $df = 2$, $p = \text{n.s.}$ Individual preferences do vary across the specific discrete media, $\chi^2 = 24.24$, $df = 9$, $p < .01$., but not across the specific media combinations, $\chi^2 = 1.60$, $df = 2$, $p = \text{n.s.}$ Social influences vary across both the specific discrete media, $\chi^2 = 63.78$, $df = 9$, $p > < .001$, and across the specific

media combinations, $\chi^2 = 16.91$, $df = 2$, $p < .01$. This means that of the three influences, social influences vary the most across the specific discrete media, followed by individual preferences. For combinatorial media, social influences are the only influence that varies across the specific combinations.

To see how these relate to the specific media and media combinations, I created a matrix that demonstrates how the influences vary across media for discrete media (Table 4.5), and for media combinations (Table 4.6).

Table 4.5

Discrete Media by Influences on Use

Media	Influences on Use			N
	Media traits	Individual	Social influences	
Web	87%	6%	7%	1316
Email	76	9	14	677
FtF	82	8	10	471
Computer	79	4	17	238
Paper	75	12	12	138
Telephone	83	7	10	137
Intranet	71	4	25	116
Web conference	89	1	10	74
Newsgroup	89	0	11	53
PDA	86	0	14	43
Database	92	5	3	39
Mobile Phone	56	18	26	39

Table 4.6

Media Combinations and Influences on Use

Media Combinations		Influences on Use		
	Media traits	Individual	Social influences	N
Web then FtF	93%	4%	3%	45
Computer then Web	77	0	23	31
FtF then email	88	4	8	26
Web then comp	96	4	0	24
Email then FtF	94	0	6	18
Web then telephone	94	0	6	16
Email then telephone	69	0	32	16
Web then email	92	0	8	13
FtF then Web	75	8	17	12
Web then paper	45	9	45	11
Computer then email	90	0	10	10
Telephone then email	60	10	30	10

Note: This table only includes the combinations that appear 10 or more times in the dataset.

The media traits' influence on specific media ranges from 44% for the two-way pager to 93% for the combination Web then FtF. The mean is 78.4%. Of the 10 most frequently used media mentioned in the table above, all but three are above the mean. Social influences on specific media vary from 2% to 56%. The mean is 16.3%. There is considerably more variability in the top ten most frequently used media and the effect social influence has on their use. There is considerably less social influence on Web use (7%) than on the intranet (25%). There are also no social influences on the combination "Web then computer," yet the reverse of the "computer then Web" is on the higher end of social influences (23%). Individual preferences influence media use with a $M = 5.2\%$. The range is from 0% to 18% and four media are not influenced at all by individual preferences. So newsgroups and the PDA are not influenced by individual preferences at all, yet paper is influenced much more (12%).

*Summary of Reasons and Influences Variance for Specific Media
and Media Combinations*

When looking at a finer level, the way these people used the specific media varied depending on the reasons for use and the influences. Of the five reasons studied, documentation reasons vary the most across the ten most frequently used discrete media. This is followed by persuasion, information, and social reasons. The chi-square analysis for influences showed that as a whole, they vary across media. Specifically, social influences vary the most across discrete media, with personal preferences also varying to a lesser degree. The only influence that varies across the specific media combinations is social influences.

Delving More Deeply into Combinations

Research Question 8

Research question eight asked how we can describe combinations of media. Specifically it asked if we examine media used second in a combination, what do we learn about (a) media that are used second, (b) the influences on second media use, and (c) the reasons linked to how people use a medium second. I begin by characterizing and grouping the discrete media used in this study. This allows me to compare combinations of media to discrete media. From here I delve more deeply into a characterization of media combinations. Finally, in research question nine, I see how complex combinations differ from both two medium combinations and discrete media use with respect to influences and reasons for use.

Characterizing Discrete Media

I began characterizing the data using a frequency analysis. In this study discrete media were used 4,448 times. Of those times, the Web is used 33% of the time, email 17%, FtF 12%, computer 7%, paper 5%, telephone 4%, intranet 3%, Web conferencing 2%, newsgroups, databases, PDAs, mobile phone, and fax all 1%, and voicemail, videoconferencing, and two-way pagers at ½%.

I used hierarchical clustering and multi-dimensional scaling to help understand how these discrete media group. The largest gap in the agglomeration schedule suggests that there are three clusters: paper+telephone, computer+FtF+email, and the Web. The second largest gap suggests five clusters, with each medium being a single cluster and only paper and telephone forming an actual group (see Table 4.7).

Theoretically, this is difficult to analyze, so I also ran an MDS to see a visual representation of these relationships (see Figure 4.1).

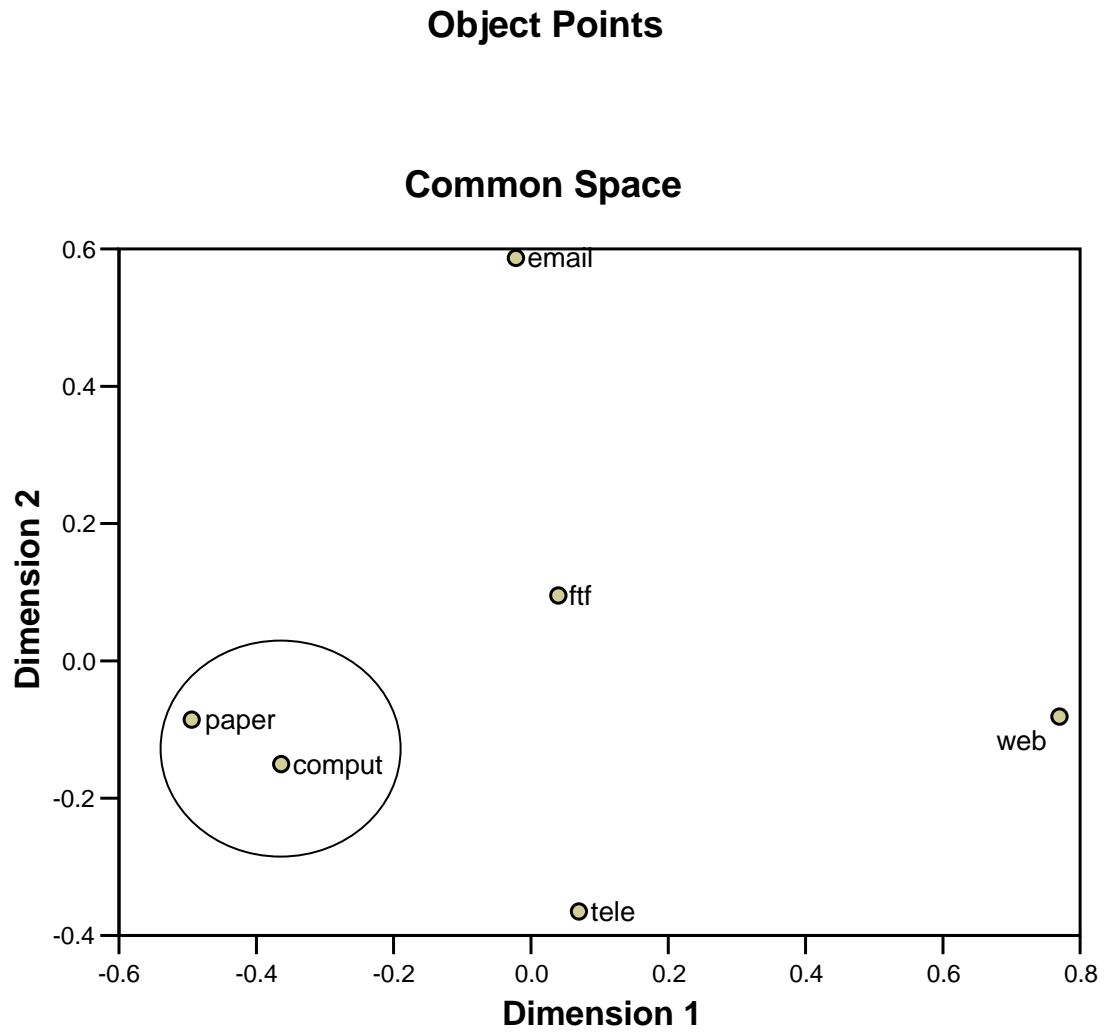
Table 4.7

Agglomeration Schedule for Cluster Analysis of Media Used Discretely

Stage	Combination	Distance coefficient
1	paper, telephone, computer, FtF, email, & Web	33,438
2	paper, telephone, computer, FtF and email	18,453
3	paper, telephone, computer, and FtF	6,732
2	paper telephone & computer	4,465
1	paper and telephone	2,146

Figure 4.1. Spatial Representation of Media Used Discretely.

The Multidimensional Analysis of the six most frequently used media shows how they group in a two dimensional space.



The most obvious cluster from the MDS analysis is paper and computer, but it is plausible that the telephone also joins this cluster, as suggested by the hierarchical clustering. On the surface these appear conflicting, but the MDS is compressing what is likely a multidimensional space into two dimensions. Paper is on the edge of this graph and so is the telephone. If you imagine these being in a three dimensional space, paper and telephone could cluster. The remaining three media, FtF, email, and Web are quite separate on the MDS. Examining the cluster analysis suggestion that the computer, FtF, and email form a cluster is not theoretically relevant. It appears that the discrete media data in this study do not form any theoretically useful groupings. They appear to behave in different ways.

To understand these relationships more clearly, I also performed a series of regressions to see if any of the uses or influences predicted the use of any discrete medium or of these clusters mentioned above. There were two significant regressions that might help to explain uses that predict email and FtF use. Documentation, social, and entertainment reasons were included in a model to predict the use of email. The overall model was significant, $R = .45$, $R^2 = .20$, $F(3, 65) = 5.12$, $p < .01$. Documentation was the only significant individual predictor, $\beta = .39$, $p < .001$, but two others were marginally significant. Entertainment reasons had a $\beta = .21$, $p = .07$, and social reasons had a $\beta = .20$, $p = .09$. Therefore, documentation, social, and entertainment reasons explain 20% of the variance in using email to communicate.

The significant predictors for FtF, as a discretely used medium, differed from email. Here, persuasion reasons predicted the use of FtF, $R = .25$, $R^2 = .06$, $F(1, 65) =$

4.3, $p < .05$. Persuasion reasons explain 6% of the variance in using FtF as a medium to communicate.

There was also one regression predicting the use of the computer as an discretely used medium that was marginally significant. Here, documentation reasons predicted the use of the computer, $R = .23$, $R^2 = .05$, $F(1, 65) = 3.5$, $p = .07$.

Combinations of Two Media

The most frequently mentioned combinations were those containing two media in a sequence. There were a total of 328 two media combinations coded in this dataset. See Table 4.8 for a visual representation of these combinations organized by frequency of media chosen first, yet also displaying the frequency of media used second in a combination.

Table 4.8
Matrix of Combinations Containing Two Media

	<i>Medium Used Second</i>												
	Web	Email	FtF	Comp	Paper	Tele	Intra	News Group	Data Base	PDA	Mob Phone	Fax	Total 1stMedium
Ist Medium													
Web		14	47	25	11	16	1	1	5	8		2	130
Email	8		18	3	4	18				4	1		56
FtF	14	26			9	9		4	1				63
Comp	31	11	6								2		50
Paper	1	1		7		2						2	13
Tele		10	2	1									13
Intra						2							2
News Group Database													
PDA			1										1
Mob. Phone				2									2
Fax		1											1
Total 2nd Medium	54	63	74	38	24	47	1	5	6	12	3	4	331

Note: Complex sequences (N=42), those involving more than two media, are not included. General Media Use and media not participating in combinations are also not included in this table.

The most frequently used combinations are: (a) Web then FtF ($N = 47$), (b) Computer then Web ($N = 31$), (c) FtF then email ($N = 26$), and (d) Web then Computer ($N = 25$). The medium most frequently used second in a combination is FtF ($N = 74$), followed by email ($N = 62$). To understand more about these combinations, let us examine the relationships between the two-media combinations and influences on use (See Table 4.9).

Table 4.9

Frequency of Media Combinations and Influences on Use

Combination Used	N	Media consid.	Individ. Differences	Social Influences
Computer then Web	31	77%	0%	23%
FtF then email	26	88	4	8
Web then comp	24	96	4	0
Email then FtF	18	94	0	6
Web then telephone	16	94	0	6
Email then telephone	16	69	0	32
Web then email	13	92	0	8
FtF then Web	12	75	8	17
Web then paper	11	45	9	45
Computer then email	10	90	0	10
Telephone then email	10	60	10	30

Note: This table only includes the combinations that appear 10 or more times in the dataset.

Just as we saw in the discrete media, two-media combinations are also influenced most frequently by media considerations. There are a few combinations that stand out from this. First, social influences play a role in combinations where the computer is followed by the Web (23%), email is followed by the telephone (32%), Web is followed by paper (45%), and telephone is followed by email (30%). All of these numbers are higher than what we saw for social influences' effect on discrete media ($M = 16.3\%$). With media considerations three combinations are lower than the mean for discrete media ($M = 78\%$). These are email then telephone, 69%, telephone then email, 60%, and Web then paper, 45%). The individual differences category only beats the discrete media ($M = 5.3\%$) in three combinations: telephone then email, 10%, Web then paper, 9%, and FtF then Web, 8%).

It is also important to characterize the two-media combinations by the reasons for their use. Here, I focus on the specific combinations and compare them to discrete media use. Table 4.10 summarizes the top combinations and the five reasons.

Table 4.10

Frequency of Media Combinations and Reasons for Use

Combination Used	N	Reasons for Use				
		Info	Social	Persuade	Enter.	Docum
Web then FtF	46	64%	0%	37%	0%	0%
Computer then Web	31	32	0	0	0	68
FtF then email	26	23	8	50	0	19
Web then comp	25	80	0	20	0	0
Email then FtF	18	67	0	33	0	0
Email then telephone	17	59	12	29	0	0
Web then telephone	16	81	0	19	0	0
Web then email	14	86	0	14	0	0
FtF then Web	14	64	0	36	0	0
Computer then email	12	92	0	8	0	0
Web then paper	11	55	0	45	0	0
Telephone then email	10	40	0	40	0	20

Note: This table only includes the combinations that appear 10 or more times in the dataset.

As mentioned previously, two-media combinations, like discrete media, are used primarily for information reasons. The most frequently used media combination, the Web followed by FtF, is used 64% of the time for information reasons, and 37% for persuasion. When using the computer followed by the Web, a different use profile emerges. Here this combination is only used for information 32% of the time, but it is used 68% of the time for documentation purposes. Telephone then email also has a unique profile because 40% of the time it is used for information, 40% of the time it is used for persuasion, and 20% of time it is used for documentation.

Characterizing the Use of the Second Medium in a Sequence

Knowing the frequency and distribution of the two-media sequences provides us some insight into how media combinations function, but it would be helpful to identify some underlying patterns. Because these data capture people's unsolicited talk about combinations, it is difficult to speculate about the first medium people mentioned in a sequence. Perhaps they themselves are remembering a complex sequence and they must choose a starting point. Therefore, characterizing the medium-people-mentioned-first is not necessarily valid. We do know that when two media are mentioned in a sequence, the second one follows the first. For this reason, I will focus the characterization on the medium-mentioned-second in the sequence.

As shown before in Table 4.8, FtF is most frequently chosen as the second medium at 22% of the time. This is followed by email (19%), Web (16%), Telephone (14%), Computer (11%), and Paper (7%). These are the same six media used most frequently when they are mentioned discretely, but the order of occurrence frequency is

different when they appear second. To explore how these second media relate to the various parts of the model, I will next link them to influences and reasons.

Table 4.11 shows the frequency of each medium-used-second that was also coded into one of the influence categories (this explains why the N is different from the raw total above).

Table 4.11

2nd Medium Used by Influences

<u>2nd Medium Used</u>	<u>N</u>	<u>Media traits</u>	<u>Individual</u>	<u>Social Influences</u>
Email	62	86%	3%	11%
Web	53	79	4	17
Telephone	44	84	0	16
Computer	37	92	3	5
FtF	33	91	3	6
Paper	23	61	13	26
PDA	10	100	0	0
Fax	6	75	25	0
Database	6	100	0	0
Newsgroups	5	100	0	0
Intranet	3	100	0	0

Just as we saw in the discrete media and two-media combinations, second-used-media are also influenced most frequently by media considerations. Here, there is only one medium-used-second that is influenced considerably less than the mean for discrete media ($M = 78\%$), and that is paper at 61%. But the overall distribution for paper is similar when it is used first and second. We also have several media-used-second that are considerably above the mean for discrete use. These are computer (79% for discrete use and 92% when used second), FtF (82% for discrete use and 91% when used second), and email (76% for discrete use and 86% when used second). Social influences had a mean of 16.3% for discrete media, and once again, paper is the only medium-used-second that is considerably more than this at 26%. The individual differences category beats the discrete media ($M = 5.3\%$) in two situations: Fax, 25%, and paper, 13%. A consolidated glance at this comparison is found in Table 4.12.

Table 4.12

Influences on Use Comparison Between Media used Alone and Second

	Influences when used discretely				Influences when used second			
	N	Media	Social	Individual	N	Media	Social	Individual
Discrete Medium								
Web	1316	87%	7%	6%	53	79%	17%	4%
Email	677	76	14	9	62	86	11	3
FtF	471	82	10	8	33	91	6	3
Computer	238	79	17	4	37	92	5	3
Telephone	137	83	10	7	44	84	16	0
Paper	138	75	12	12	23	61	26	13

Next, let us examine how the reasons for use change when a medium is used second. For this comparison, once again I will show a table that compares the media-used-second to media used discretely (see Table 4.13).

Table 4.13

Reasons for Use Comparison Between Media Used Alone and Second

	Reasons when used discretely						Reasons when used second					
	N	Info.	Pers.	Doc.	Social	Entertain	N	Info	Pers.	Doc	Social	Entertain
Discrete Medium												
Web	1406	77%	15%	3%	1%	3%	56	47%	13%	41%	0%	0%
Email	709	61	14	19	5	2	67	55	30	12	3	0
FtF	523	43	46	1	8	2	79	61	38	0	0	1
Computer	248	26	24	48	0	2	38	61	29	11	0	0
Telephone	142	61	37	0	0	3	46	72	24	0	4	0
Paper	201	76	7	17	0	0	24	42	42	17	0	0

Upon examination of this comparison, you will see that only the telephone follows a similar use distribution regardless of whether it is used discretely or second in a sequence. Some striking differences are seen in the Web and FtF categories. When people use the Web as a discrete medium, 77% of the time it is for information purposes, 1% of the time it is for social reasons, 15% of the time it is for persuasion, 3% of the time it is for entertainment, and 3% of the time it is to document. But when the Web is the second medium, only 47% of the time is it used for information, 0% for social, 0% for entertainment, 13% for persuasion, and documentation increases to 41%. This distribution across uses is very different from any other medium used discretely or second. When FtF is used discretely, it is used for information 43% of the time, for social reasons, 8% of the time, persuasion 46%, entertainment 2% and documentation 1%. But when FtF is the second medium, information uses jump to 61% and persuasion drops to 38%.

To better understand the relationships between the six media when they are used second, I performed a hierarchical cluster analysis. Table 4.14 shows that the three cluster solution is clearly distinct from the other solutions with a ratio between the second and third cluster being 2.59. This suggests that paper and computer cluster together, telephone and FtF cluster, and Web and email cluster.

Table 4.14

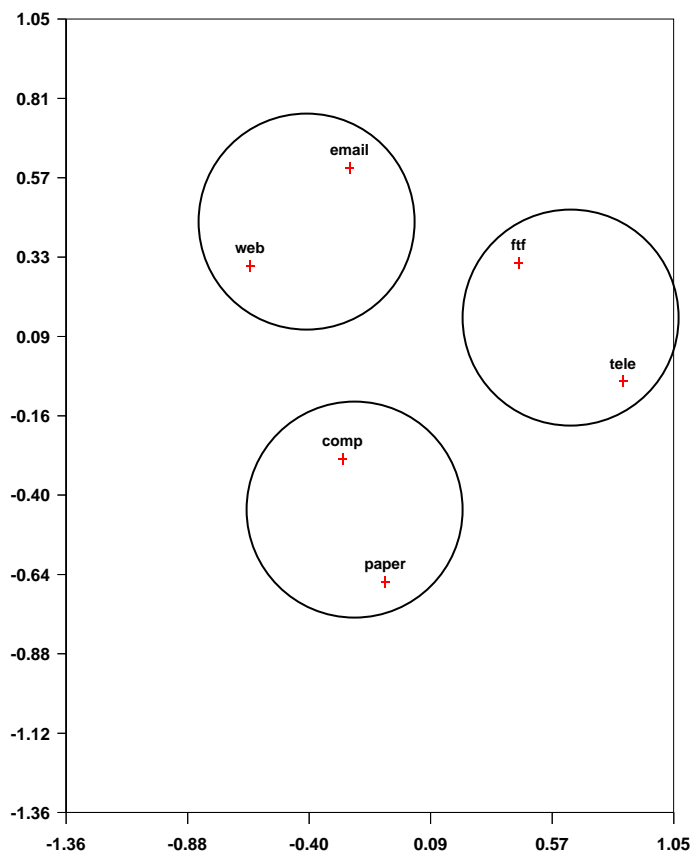
Agglomeration Schedule for Cluster Analysis of Media Used Second

Stage	# of clusters	Combination	Distance coefficient
1	3	1&2, 4&5, 3&6	.2950
2	2	1&2, 4&5	.7626
3	1	1 and 2	.8376

The multidimensional scaling also supports the view of three clusters. See

Figure 4.2 below.

Figure 4.2. Spatial Representation of Media Used Second in a Combination.



Characterizing Complex Sequences

The final research question in this study asked if complex combinations—those involving more than two media—are different from two-media combinations? As mentioned previously, only 17 of the 64 interviewees discussed complex sequences, and with such a small number of cases, multivariate statistical tests are not likely to find any relationships. Therefore, I will address this question with distribution comparisons and narrative examples.

An examination of the frequency distribution across reasons for use suggests that complex sequences follow a pattern not unlike FtF (see Table 4.15).

Table 4.15

Comparison of Complex Sequences to FtF

Media	Info.	Social	Persuade	Enter.	Document	N
Complex sequences	50%	3%	43%	3%	3%	40
FtF as a discrete medium	43	8	46	2	1	523
FtF as a second medium	61	0	38	1	0	79

In all situations, the reasons are approximately split between information and persuasion reasons. There are no other frequently used discrete media where a similar split occurs. In most media combinations, the persuasion reasons increased when the medium was used second, but no other media followed the same pattern as FtF.

Frequency of Complex Combinations and Influences on Use

In most of the frequently used combinations and in the discrete media use, media considerations clearly dominate the categories of influences. However, complex sequences are only 66% in the media consideration category and 29% in social influences, with the balance of 6% falling in individual differences. There are only two media combinations that follow a similar pattern, email then telephone, and telephone then email (See Table 4.16).

Table 4.16

Complex Sequences Compared to Discrete and Media Combinations

Combination Used	Total	Media traits	Individual	Social Influences
Email then telephone	16	69%	0%	32%
Telephone then email	10	60	10	30
Paper as 2 nd medium	23	61	13	26
Intranet	116	71	4	25
Complex sequences	35	66	6	29

Summary of Results, Chapter Four

The results found in this chapter reveal relationships relevant to (a) the overall research model and (b) specific media combinations. Across all media, the Web is used most frequently and it is used for information reasons. Entertainment reasons predict the use of a discrete medium, while persuasion and documentation (marginally significant) predict the use of a media combination. Furthermore, people in interorganizational job roles use media for persuasion. There were also some culture differences because Norwegian workers used media for more information reasons, while U.S. workers used them more for entertainment. Finally, both reasons and influences vary across the specific media and by examining the medium-used-second in a sequence, we see that they group in theoretically interesting ways. Examining these theoretical contributions more completely and interpreting these results is found in the next chapter of this dissertation.

CHAPTER FIVE: DISCUSSION

Chapter four reported the results from this study. In this chapter, I begin by discussing the relationships between the various parts of my research model: reasons and media, influences and media, and influences and reasons; then I spend time focusing on specific combinations of media. In the process, I link the findings back to the theoretical perspectives presented in chapter one, and I use narrative examples from the data to supplement the statistical results. From there I discuss the limitations of this research and provide details on five main ideas for future research.

The results indicate that people in this study use the Web most often as a discrete medium, and it is used for information reasons. When people have entertainment needs, they use a discrete medium, yet when they need to persuade others or to document, they choose a media combination. Media traits are most frequently credited with influencing media decisions, yet none of the three influences predict either combinatorial or discrete media use. There are also relationships between influences and reasons people use media. Interorganizational communicators persuade others and intraorganizational communicators give and receive information. In this study, being Norwegian also means that you use media for information reasons, while American workers use it more for entertainment. When examining specific discrete and combinatorial media—as opposed to the agglomerated dichotomous variable—most reasons and influences vary across them. Documentation and persuasion predict the use of a discrete medium, email and FtF respectively. But when media are used second in a combination, they can be categorized into three groupings, (a) auditory-linking, (b)

textual-linking, and (c) textual-personal. For a summary of the all the major conclusions, see Table 5.1.

Table 5.1

Summary of Main Conclusions From This Combinatorial Media Study

1. The Web is used most often for information reasons.
2. People are more likely to use a discrete medium when they want to be entertained.
3. When trying to persuade others, people are more likely to use media combinations than a discrete medium.
4. People say that media traits influence their media use most often.
5. Intraorganizational communicators use media for information reasons, while interorganizational communicators use it for persuasion reasons.
6. Norwegian workers use media for information reasons more than U.S. workers.
7. U.S. workers use media for entertainment reasons more than Norwegian workers.
8. Documentation reasons to use media vary the most across discrete media.
9. There are more social influences on media used for intraorganizational communication.
10. Social influences matter most when people use media for “other-based” reasons—i.e., social, persuasion, and documentation
11. Email is used for documentation, and FtF is used for persuasion.
12. The Web is most often used first in a media combination and it is used for learning, competitive intelligence, and preparation reasons.
13. The most frequent media combination is the Web followed by FtF.
14. FtF is the medium most frequently used second in a media combination.

15. Social influences affect paper use almost twice as frequently as any other medium when media appear second in a combination.
 16. When paper and email are used second in a media combination, their persuasion uses at least double in frequency.
 17. When media are used second in a combination, they group according to their availability of audio cues and their ability to connect with external resources.
 18. Complex sequences of media use closely resemble FtF in their distribution across all uses.
-

Taken together, these findings contribute to the continued development of the role of persuasion in media use, social influence theories, and how combinations are being used in organizations today.

Interpretation of Findings

This section discusses each part of the model—reasons for use, influences on use, and reasons and influences—separately, integrates them, and expands into the findings for combinatorial media use. The primary outcome variables discussed here are (a) the use of discrete media, (b) the use of media combinations, (c) the use of a specific discrete medium or media combination, and (d) media-used second in a combination. I will interpret these findings by considering the two levels of analysis—the person-level with $N = 66$, and the incident level with $N =$ approximately 4500—that I used for this study.

Reasons for Using Media

This research contributes both in a confirming and expanding way to our knowledge on the reasons we use media in organizations. With the exception of uses

and gratifications (Katz et al., 1974), and a few empirical organizational studies that explore the uses of specific media—e.g., Dobos, 1992; Flanagin & Metzger, 2001—communication scholars have yet to develop analyses of combinatorial media use relationships found in my theoretical model. This section of the discussion focuses on how reasons for use predict the use of discrete media, media combinations, and specific media or combinations. I link these findings back to theory and propose that scholars begin considering media combinations. By using media successively and forming combinations, this study suggests that they are more persuasive.

Confirming Previous Research (H1 & H2)

This study found that the Web is used for information purposes, and the Web is the most frequently used medium. This affirms Flanagin and Metzger's (2001) work, but uses a different methodology and focuses exclusively on organizational media use. Their study split the functions of the Web into (a) information retrieval, (b) information giving, and (c) conversation. The current study combined the first two items for coding reliability reasons and called the combined measure the Web. Conversation was categorized as either newsgroups, or email, depending on the specific medium the interviewees mentioned. Even with these changes, these findings support Flanagin and Metzger's (2001) empirical results.

Using Discrete Media for Entertainment (H3)

When all the discrete media were consolidated into one variable, entertainment reasons accounted for 8% of the variance in the use of a discrete medium. This partially supported hypothesis three because as discussed in the literature review, none of the

theories providing reasons people use combinations included entertainment as a reason. When these experienced media users wanted to be entertained, they chose a discrete medium to meet that need. This is a reasonable finding because using media in combinations is likely not necessary when people want entertainment. Perhaps they already knew that a game on the Web could relieve their stress during a busy day. This type of use is not particularly strategic.

Examining the regression findings where information is marginally significant (.06 level) is also a plausible finding. This implies that when people engage in information seeking and giving activities, they pick one medium as their starting point. This is reasonable because if they find what they need, there is no reason to use several media in a sequence. Furthermore, this suggests that people are not, or do not need to be, strategic when they use media for information. A decision to use additional media is directly dependent on the outcome of their first media use attempt.

Using Media Combinations for Persuasion (RQ1)

But when people are trying to persuade others, they are more likely to use media combinations. Persuasion activities are higher risk, and in some cases the outcomes of that persuasive attempt can directly impact a job or career. For example, if salespeople fail to win business, they are normally fired.

A marginally significant finding was that documentation reasons predict the use of media combinations. Considering that there were only 66 interviewees used for these predictive analysis, this is a finding worth reporting and worthy of future research even though it was significant to the .09 level with an $r = .21$. This is a logical finding and

quite apparent in the data. Frequently this is manifest in a follow-up from a FtF conversation. For example, a semiconductor salesperson said, “If it’s really important, like critical information, definitely talk to them, as well as maybe even follow-up with and email.” This suggests a type of error-reduction that is involved in the use of combinations. A Norwegian marketing manager illustrates the way that email supplements FtF, “Seeing a face and hearing a voice is always key, and email is a supplement to this.” He goes on to explain, “In many instances I follow-up a phone conversation with an email, where I refer to our conversation and sometimes attach some additional information.”

Influences on Media Use

The Dominance of Media Traits (RQ2)

The influence predictor variables in this study—media traits, social influences, and individual differences—were derived from several theoretical perspectives (Daft & Lengel, 1984, 1986; Daft et al., 1987; Daft & Lengel, 1990; Dennis & Valacich, 1999; Fulk et al., 1990; Short et al., 1976; Sitkin et al., 1992; Trevino et al., 1990). The findings show that when asked about how they use media, people say that media traits influence them 80% of the time when an influence is mentioned. Previous research has attempted to test the various influence theories using a variety of methods. Here, the interviewers questioned ICT users about their practices, providing no prompts concerning influences, and prioritizing no one theory over another. Yet as the narrative examples showed, people talk about physical characteristics most of the time. This

finding is supported in Rice's (1992, 1993) empirical tests on media appropriateness and media richness.

One explanation for this finding is found in the description of the sample used for this study. These people were experienced media users in their organizations. Perhaps experienced media users have the repeated exposure to media that allows them to learn more about the characteristics of each medium. For example, a semiconductor salesperson explains, "I will very rarely page a new customer. I will try to talk to them directly over the phone... Basically what I'm trying to do is build confidence and trust within that individual." It makes sense that a salesperson might pay close attention to the available cues present in a medium. Also implied is that this salesperson might routinize communication with an on-going customer. Both parties understand that pages, or SMS, only allow a limited response and they are asynchronous—meaning that a responder can reply on his or her own timetable.

Another explanation for this finding challenges the rational perspective by using social desirability as a likely explanation. In general people want to appear rational; certainly most organizations have a requirement for rationality. March and Olsen (1982) define rationality as the use of reason in accordance with an agreed-upon set of procedures. Weick and Browning (1986) propose that "argument" is the way that rationality requirements surface in organizational discourse. The standards for rationality—goal clarity, means-ends consistency, and hierarchical integration—are a match with the assumptions of argument that emphasize "a priori assumptions, consistency, and reason-giving" (Weick & Browning, 1986, p. 246).

When asked about media use, even though they were not prompted to provide a justification for that use, people might tend to mention physical characteristics because these seem tangible. Much of the data in this study show that ICT users explain their practices by talking about the features of the technology in relation to a set of micro-circumstances. This influence may be overestimated, because admitting that you use email because your coworker uses email might be considered undesirable for a knowledge worker given their cultural emphasis on independent action (Davis, 1999; Drucker, 1993; Ledford, 1995; Robertson & Swan, 2003; Sviokla, 1996). This is paradoxical because social influences might be affecting people who do not claim social influence and the social norm is to be independent.

But there is evidence in the data suggesting that some people have no problem admitting that they use media because of others, especially salespeople. The job role distinction—*intraorganizational* or *interorganizational*—is likely important in these communication choices. Within an organization there might be more personal choice with media, but because a customer can always “walk away,” *interorganizational* communicators need to be more adaptable to meet customer preferences. While it only represented 11% of the data, the coded social influences in this study offer some insight into how people admit that they allow others to influence their use. For example, one salesperson said, “Some people say, send me an email on everything you want to communicate with me because I’m very disciplined about reading my email. That’s fine. That’s what I’ll do. Other people say, page me, I’ll always call you back. That’s fine, too.” In this situation, the customer is making a commitment to the salesperson

and it would be foolish to ignore this request. Essentially, it is in this salesperson's best interest to learn the media preferences of others and adapt to meet those needs, regardless of the physical characteristics of a medium.

Individual differences, measured as personal preferences, is the category of influence that might suffer even more from social desirability biases. For some people, admitting that you use email because you like it, is a bit too self-disclosing. They might rationalize this preference by mentioning that email allows others time to ponder a response. Another thing that can happen, especially when an interviewer pushes for specificity during an interview, is that both a personal preference and another type of influence becomes part of the response. However, people in this data did admit their personal preferences. For example, a bank COO said, "I use email. That's the first thing I ask somebody, 'Do you have email?'" In this case, the COO defined her managerial style through email, especially as it related to both providing leadership for a financial institution and by communicating with many different stakeholders. For her, email enabled all of these practices; using it meant that she could stay focused on her tasks and essentially define "small talk" as outside her boundary of communication. Setting this email-use standard up during initial conversations meant that she never had to ask people to change their media practices for her—they simply began their communication using her individual preference.

Another possibility is that once people are experienced with media, they develop personal preferences because of traits of the medium, or the needs of others, or possibly both. This is not unlike a chef who through experience has found a favorite seasoning

and uses it as a distinctive touch. This suggestion is supported by the findings of Kraut, Rice, Cool, and Fish (1998). In their study of the adoption of a new technology into a workplace, they find that both utility and normative theories coexist and even reinforce one another (but normative influences disappear quickly). They claim that it is naive to assume that these theories compete because they both function in a workplace. Note that in this study media traits and social influences were highly correlated ($r = .69$). They are overlapping considerably and in a positive direction meaning that they are tapping into some similar constructs. Contrast that with individual differences; an influence that was highly negatively correlated with media traits ($r = -.81$), yet not significantly correlated with social influences. This suggests that people either look to others for a cue as to the medium they choose, or they use their own personal preferences (so, external vs internal factors). Essentially, when people do not mention individual differences as a dominant influence and they do mention social influences, these two conditions make people more likely to mention media traits as a dominant influence. Therefore, media traits, social influence theories, and individual preference theories, are all supported.

Predictive Relationships Not Supported (H4 and RQ3)

There were no relationships found between how the three influences predict discrete and combinatorial media use. I hoped to see if one theoretical perspective lent more credibility to my desire to study media combinations, yet these findings suggest that none of the theories explain use of discrete and combinations of media. I elaborate more on this finding in the section that follows.

Organizational Variables Do Not Influence Discrete or Combinatorial Media Use
(H5a,b, & c)

The final questions in this section of the model predicted that several organizational variables would predict the use of discrete or combinatorial media. No one of these was supported. The means suggested that Norwegian workers used more combinations than U.S. workers, but that was not significant. Whether people are managers or not, have internal or external customers, or are from the U.S. or Norway, the variation within their use of discrete or combinatorial media is not explained by these organizational factors.

These nonsignificant findings might point to the reality that these organizational factors indeed do not predict combinatorial media use. However, it is also possible, especially in the case of the Norwegian workers and the U.S. workers that with a larger sample size, these differences will be significant. Because these are important organizational variables, it is worth exploring this further despite the nonsignificance of them here.

Linking Influences and Reasons for Media Use

Most times in this study, I treated both of the categories of variables as predictors for the medium or media combination used. However, with limited prior research that places both of these categories of variables into a model, it is important to see how if the influences also affect the reasons. Here I found that the influences do vary across the reasons for use and that job role and nationality affect the reasons for use.

Relationships Between Influences and Reasons (RQ4)

Influences affect the five reasons for use in different ways. Although the contingency analysis demonstrated that media traits do not significantly vary across the reasons, both individual preferences and social influences varied significantly. People said that their individual preferences influenced them the most when they were persuading (13%) and entertaining (14%). When using media for social reasons, their individual preferences mattered very little (2%).

Self or others' based reasons. Social influences mattered most when people used media for social reasons (13%). This was followed closely by documentation and persuasion. This type of influence mattered much less when people used media for entertainment (2%) and information (9%). This suggests a pattern for when people are more likely to be socially influenced to use media. This pattern breaks into “other-involved” reasons and “self-oriented” reasons. When people use media for entertainment or information, these can be considered “self-oriented” reasons because the focus of the need to communicate is to help oneself. Social reasons and persuasion are “other-involved” reasons because it takes at least one other person for these communication tasks to occur.

Documentation as other-oriented. On the surface, documentation might seem to be more “self-oriented,” however, these findings suggest the opposite. It appears that people might be using media to document because of other people. Essentially, documentation is performed because of social influences. To understand this more clearly, I will share some examples of why this might be the case. An archivist

explains, “I’m such a dictatorial persona and my boss is too that everyone is required to have the same [documentation] scheme on their computer...so we can fill in for each other...and then the next person who comes on for the next shift knows exactly where I was supposed to put it.” A Norwegian software engineer said, “Good CRM is critical for use, but what the intranet will do is to increase our knowledge and competence in certain areas that will be of advantage for both ourselves and our customers. Having a good internal resource for this is essential.” Therefore, documentation is needed for cooperation and teamwork.

Organizational Variables as Influences on Reasons (H6 & RQ5)

The three organizational variables in this study did not predict the use of discrete or combinatorial media. However, in two situations, people representing different organizational groups did use media for different reasons. Interorganizational communicators use media for more persuasion reasons and intraorganizational communicators use media for more information reasons.

Either persuade or inform. People whose job forces them to be a boundary spanner and communicate with others outside their organization are using media to persuade. The obvious explanation is that these people are in job roles, such as sales, and consulting, where persuasion is needed. This becomes a bit more complex when combined with the finding that those people communicating primarily inside their own organization are not persuading, but are instead using media for information reasons. To explain this difference, I need to briefly describe, once again, how this data was coded. Each statement made by a person was coded into one and only one of the five

reason categories, as long as a reason was given. Then the number of statements made by each person was summed by category. It makes sense that people in interorganizational job roles will be persuading more often, but don't they also need to use media to get information?

The second finding, that people internal to an organization use media for more information reasons, was not predicted and is somewhat surprising. It is also interesting to note that when communicating intraorganizationally, people might not feel the need to persuade others, so they simply send and receive information. This might provide an explanation, but if so, it certainly raises concerns about how people view their internal organizational relationships. For example, do they not consider the communication with a manager as needing persuasion? Perhaps this is something unique to knowledge workers who function primarily inside an organizational boundary. It is only with future research that we will better understand this finding.

Norway and the U.S. People from Norway are also using media for more information reasons and people from the U.S. are using it for more entertainment reasons. This is quite contrary to existing beliefs, especially if you look at the masculinity/femininity dimension on Hofstede's (1980) scale. If we extend the belief that feminine cultures, like Norway, are more receptive to people bringing their personal life to work, it makes sense they should also be more likely to use media for entertainment at work. After all, this is culturally acceptable. Furthermore, masculine cultures, like the U.S., follow a strict "work hard and keep personal life separate from work" view. Following this logic, U.S. workers caught playing a game on the Web at

work might be fired. But in this study, it is people from the U.S. who are using media for entertainment reasons at work more than Norway. Perhaps people from Norway need media less for entertainment precisely because they can bring their personal life to work. Yet in the U.S., the Web offers some escapism and because these workers are “using the computer,” their entertainment uses are less likely to be detected.

The Norwegian workers clearly state that their entertainment use of media occurs away from work. “My hobby, at home, is to build speakers and amplifiers, and I have found very useful information [on the Web] to help me in my projects,” says one software engineer. Another one talks about using the Internet to purchase items, “It is first and foremost to use it in a work context—in a private context I use it to order movie tickets, net bank, and all those services. The U.S. workers appear to spontaneously mention how they use media for entertainment, yet they do not specify that it is done on their private time. For example, one engineer said, “So I would send out an email and say, ‘The [mountain bike] ride is going to be here or there or wherever, and it’s going to be at such-and-such a time.’”

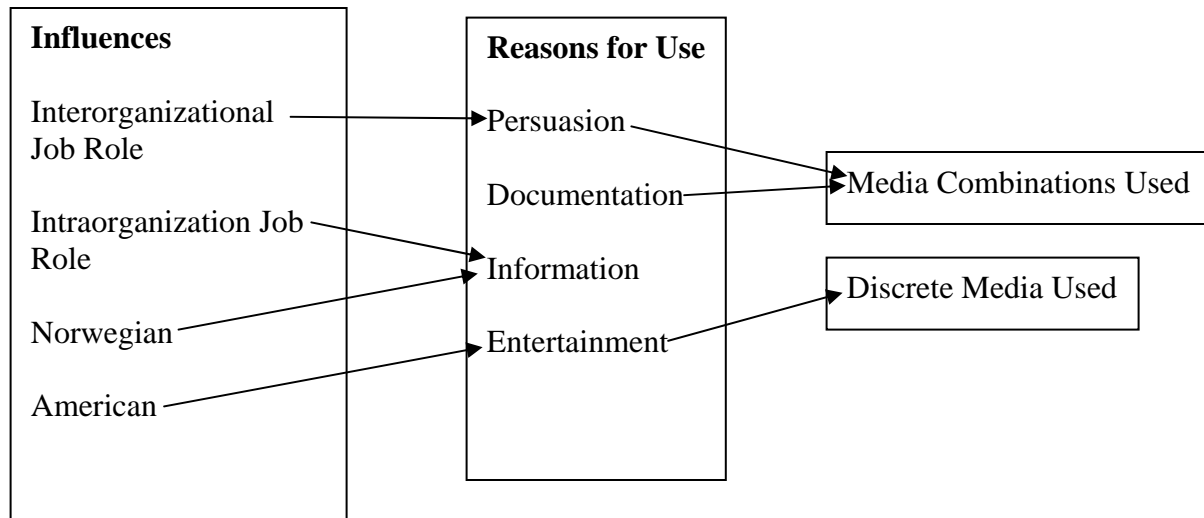
There are several explanations for this finding. First, the people interviewed here were all knowledge workers and not subject to much managerial control (Davis, 1999; Robertson & Swan, 2003). Many of them already work more than a standard 40 hour work week and perhaps their work and fun boundaries are becoming more blurred. They use the entertainment functions of media along with the other reasons as a way to do their job. Another explanation is that as organizations make media available for their workers, it is also more available for entertainment. For example, the Web offers many

entertainment functions that are accessed from the same computer that people use to do their work. For example, one U.S. small business owner said, “I’ll get my email horoscope every morning.” Another U.S. Chief Financial Officer at a Bank explained how she used her PDA for entertainment, “And some for personal use including Rolling Stones magazine.”

Summary of Relationships in the Model

The focus thus far has been to explain the findings relative to the relationships between (a) the two categories of predictors and either discrete or combinatorial media, and (b) the two categories of predictors. Relative to influences, these results support previous findings (Carlson & Davis, 1998; Kraut et al., 1998) and suggest that media characteristic theories, social influence perspectives, and individual preferences all three co-exist in organizational media use. The reasons highlight the important role that media combinations likely play when trying to persuade others. For an overview of how the findings map onto my conceptual model, see Figure 5.1.

Figure 5.1. Empirically Tested Model of Combinatorial Media Use



Delving into Media Combinations More Deeply

Until now, I have used two categories of media, discrete and combinations, to test the relationships in the model. While this is a dichotomous way to view media, it provides little detail concerning specific discrete media or media combinations. In this next section, I focus on specific combinations of media, exploring in depth how media-used second in a combination can provide insight into media use.

Most Reasons Do Vary Across Media (RQ6)

The chi-square results from the sixth research question show that not only was the overall chi-square significant for the use of discrete media, but the contingency analyses were almost all significant as well. The one exception was entertainment; it was not used differentially across the top 10 discrete media.

Documentation Reasons Varied the Most

The reason that varied the most was documentation. This finding is directly explained by the inherent documenting ability present in the various media. Some, such as email, document every communication attempt and in this data email is used for documentation 19% of the time. People in this data are aware of the power of email for documentation. For example, one U.S. manager said, “It’s always good to have a paper trail of task requests so that there’s an auditing capability there. ‘Oh yes, I did ask you on Monday, see, here’s my email.’” Other media, such as FtF and the telephone have no documenting ability. People said that they used them for documentation 1% and 0% respectively. It is important to note that sometimes this lack of documentation is also desired. A personnel manager says, “On the personnel issues, we really don’t want that

stuff on email.” Documentation requirements tend to necessitate the use of some media and preclude the use of others.

The computer is another medium used extensively for documentation (48% of the time). This is an internal medium that was coded for all mentions of software residing on a person’s personal computer (as opposed to the Web or intranet). It does make sense that personal computers are used extensively for documentation and organizing information. For example, one interviewee said, “I have a program here called One Space, and One Space takes forever to load, but it’s a very unique software that indexes your entire computer, including all email, all Web, all everything that you’ve possibly ever done in your life.”

Persuasion Reasons also Varied Across Discrete Media

FtF and the telephone (46% and 37% respectively) were used most frequently for persuasion reasons. While, not all that surprising, paper and the intranet (7% and 8% respectively) were used least frequently for persuasion. These findings, while not measuring effectiveness of these strategies, support other work that has focused on the persuasive power of FtF communication. Persuasion scholars have long touted the value of using FtF over mass media to persuade others (e.g., Berelson, Lazarsfeld, & McPhee, 1954) and many have empirically demonstrated that it can be more persuasive than CMC (e.g., Wilson, 2003). The people in this study were experienced media users, so although we do not know if their strategies were effective, we do know that for persuasion they used FtF most frequently. The telephone is also used quite frequently for persuasion; twice as often as email (14%) or the Web (15%). The frequency that the

phone is used for persuasion increases even more if the mobile phone category (43%) is combined with the telephone (37%). These findings imply that speaking with some-one real-time is prioritized by the people in this study when their goals are persuasion.

Information Reasons

The Web, paper, and intranet were all used approximately 75% of the time for information reasons. These three media represent three different types of information that seem to matter to the people in this study. The Web provides information external to their organization, yet the intranet provides internal organizational information. The information sent and received via paper is more complex. Examination of the N6 data shows that sometimes people are receiving external information by paper magazines. For example, a customer service manager said, “There’s a lot of magazines in the field of [Customer Relation Management]CRM, magazines related to news and information.” People also receive internal information like, “I’ll get memos from our staff.” People also use textbooks as an information source. For example, a Norwegian software developer said, “The information I need at this stage [of the software development process], is usually very detailed, so textbooks are often used.” Another software developer said, “I previously worked at a public office and there I used stick-it notes for lots of purposes.” So paper is still used, and in many different forms.

Computer Usage is Paradoxical

When comparing the distribution of uses for the computer, information uses were quite low; only 26% of the coded data fell into this category. The only other medium with less than 50% of the coded data falling into the information category was

FtF at 43%. It is interesting that the place people use most often to document, the computer (48%), is the discrete medium they use least often for information (26%). Considering that this study coded the use of all software into the computer category, this finding raises questions about how often people use the information they have so carefully organized and documented. Perhaps they do not view the act of checking their resources as a separate activity. But these frequencies suggest that when they want information, these experienced media users look outside their own personal resources; the Web, the intranet, and paper. Contractor and Monge (2002) call these media “knowledge repositories” precisely because of these types of finding from other studies as well.

Media Used for Social Reasons

Of all the specific discrete media, FtF was used less than 50% of the time for information. Looking at the distribution of uses for FtF—information (43%) and persuasion (46%)—we see that they are used with similar frequencies. But the final 8% of FtF uses fall into the social category. People in this dataset did not speak often of social reasons for using media (only 2.4%), but when they did, FtF was the top medium they used. Paper was never used for social reasons. This finding is not surprising because people do not typically socialize using paper. They might send a formal invitation using paper as the medium, but that is not viewed as socializing. Email, the second most frequently used medium reported in this study, was used 5% of the time for social reasons. This frequency represented a very slightly edge over the times the telephone is used for social reasons (3%). Perhaps experienced users find that email

works fine for socializing. One telecommunication research analyst says, “Even the beer call on Fridays is announced by email.” A Norwegian energy consultant provides one potential reason for an email advantage. “I want the person to read the email when they have the opportunity, if they are busy. [I communicate with] one girl friend more via email because the two of us have very busy jobs...so it is just a quick message in ‘how are you doing, hi there.’” Perhaps the asynchronous nature of email makes it more advantageous for socializing because the communication happens at times that are convenient to both parties. With the telephone, you might catch someone at a bad time.

Influences Do Vary Across Media (RQ7)

The chi-square results from the seventh research question shed some light on how the three categories of influences vary across the specific media. The overall chi-square was significant and the contingency analyses show that social influences and personal preferences do vary across discrete media. Furthermore, social influences are the only influence to vary across media combinations.

Media Traits

Regardless of medium, discrete or combination, characteristics of that medium influence its use in similar ways. Theoretically this means that regardless of medium, theories such as media choice and its derivatives (Daft & Lengel, 1984, 1986; Daft et al., 1987; Daft & Lengel, 1990; Trevino et al., 1990); social presence theory (Rice, 1993; Short et al., 1976); media synchronicity theory (Dennis & Valacich, 1999); and symbolic characteristic theories (Sitkin et al., 1992); influence the different media in similar ways. For example, even when people talk of FtF, they mention its traits—

synchronicity, availability of many verbal and nonverbal cues—and while the combination of traits is unique to a given medium, the overall influence of those traits will not matter more in one medium than another.

Social Influences

This is different when we talk of social influences (Fulk et al., 1990). Here, the influences of others will matter more with some media or media combinations and less with others. This implies that using media in combinations is more of a socially-constructed activity than using a discrete medium. Rice (1993) showed that social influences seemed significant only concerning new media, and especially when communicating through those new media—that is, when ambiguity/uncertainty is the highest. The frequency data suggest that social influences matter more when using the intranet (25% of all influences), and less when using the Web (7% of all influences) and Databases (3% of all influences). It also matters more when using the combination of computer then Web (23% of all influences on this combination), and not at all when using the Web then a computer (0%).

Social influences might matter more when people use the intranet because these are a within-organizational entity. Typically these are repositories for internal, often confidential information, and employees are encouraged to use them for information and to contribute back to them. Communicating on an intranet implies a membership marker for who, personally, is a valid participant; it can define a virtual social group. It is likely that managers and co-workers encourage one another to use these resources.

Therefore, social influences on intranets are not only salient, but very appropriate in organizational life.

When using the Web and databases, social influences matter considerably less. To investigate this finding, I relied on the search mechanism in N6 and examined the raw coded text. I combined this approach with an inspection of the frequencies of influences on these media. First, both of these media were influenced very heavily by media traits (87% for the Web, and 92% for databases). The text data suggests that people use the Web because they know and rely on the inherent capabilities of this medium. Contrast this with how people use the mobile phone. Media traits are credited for influencing its use only 56% of the time.

The Web is a link to the world outside their organization and the people in this study use it pervasively for external information. Databases are more of an individual activity. Thus databases are less socially observable and less susceptible to social influence. These are typically found on a person's personal desktop and they too are used because of the type of documentation and information they provide.

It is more complex to explain why social influences are more powerful when using the combination, computer followed by the Web, yet not at all influential when using the reverse combination. Examination of the raw interview data coded into these categories revealed that in the case of the computer followed by the Web, people were creating documents using their computer, and then because of requirements from others, they posted that information on the Web. In the reverse situation, when people used the Web followed by the computer, they never said this was due to social influences. Once

again, examination of the raw interview data revealed that when people spoke of this combination, 80% of the time, they were talking about creating PowerPoint presentations. Typically they discussed using the Web to gather data for their PowerPoint presentations. For example, one researcher whose job was conducting competitive intelligence said, “And the nice thing about the Web is that you can cut and paste and you can ...transfer it directly into either Microsoft PowerPoint presentations or into an Excel spreadsheet.” This type of combination relies much more heavily on the media traits of using the Web than PowerPoint (96%) and not at all on the influences of others.

Individual Differences

The final finding addressing this question is that individual differences also vary across discrete media. In particular, personal preferences influence the use of paper (12%) email (9%) and FtF (8%) considerably more often than they influence the use of newsgroups (0%) or Webconferences (1%). The paper finding is particularly interesting because it demonstrates that even though the organizational knowledge workers in this study had access to all types of new media, and they were experienced media users, they still like paper. This finding is supported in Rice and Schneider’s (2005) study of desktop artifacts. They found that regardless of job function or experience with technology, people still use paper items—like post-it-notes or paper reminders—as part of their work. They further found that people were reluctant to give-up their paper even if an electronic equivalent is available.

The people in this study also choose email and FtF because they like those media as well. Their personal preferences do not really influence how they use newsgroups or Webconferences, which are chosen less from “liking,” but from other requirements. Examination of the raw N6 data shows that when people use newsgroups they do so to learn and to get information from others. Fundamentally, this is a physical characteristic of this medium. People also do not necessarily say that they like Webconferences, but they do use them for sending and receiving information. Statistically, individual differences do vary because they affect some media more than others.

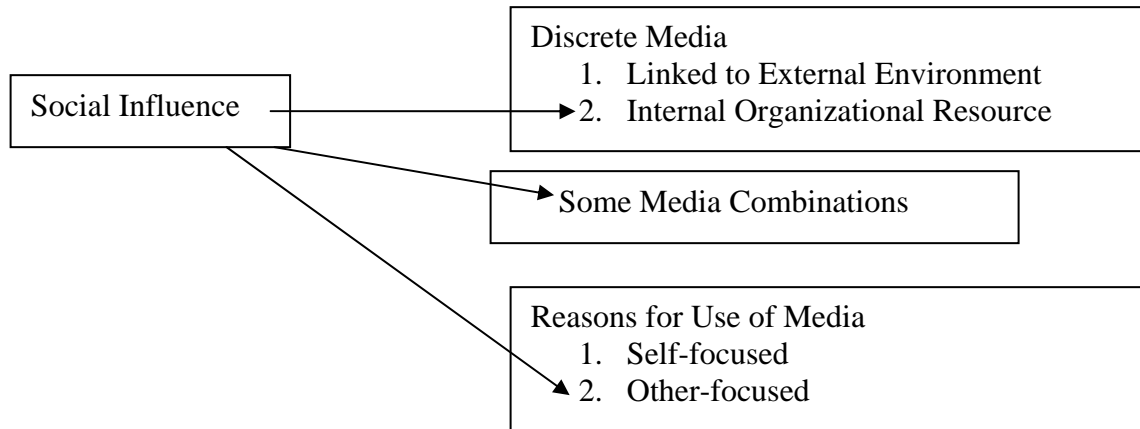
The Role of Social Influence in Media Combinations

This study contributes more directly to an understanding of how social influence might work in organizations. Scholars of interpersonal communication have studied this, for example Walther (1996) found that the variations in media preferences for relational communication can be explained by social-information processing. Here, social influences played a more prominent role with (a) media designed for internal organizational use, (b) media combinations, and (c) when the reasons they used media were more “other-focused.” This research also contributes to the literature on reasons people use media. Here, we see that people use a discrete medium when their reasons for use are more self-focused—i.e., information and entertainment, and combinations of media when they interact with others—i.e., persuasion and documentation.

This suggests that the following model represents these relationships relative to social influences:

Figure 5.2. Social Influences in Organizational Media Use.

This figure represents the places where social influences are likely more powerful. This does not mean that social influences do not exist in the relationships where arrows are not drawn, but simply that the relationships are weaker.



Characterizing Discrete Media

In the previous section, I elaborated on relationships found in the more micro-level of specific media and how these related to reasons and influences. Now I will examine the six most frequently used discrete media—Web, email, FtF, telephone, computer, and paper—and see which reasons predict use of a specific discrete medium. Because the results from the MDS and hierarchical clustering provided little information except that the discrete media are used differently, I will focus on the findings from the regressions.

Email for Documentation

This study found that when people have documentation needs, they use email. This makes sense from a utility perspective because email is text-based and capable of providing easy access to an often needed audit trail. The value of using email for documentation has been shown in other studies (e.g., Markus, 1994b), and Markus (1994b) even used this as a justification for why scholars should view email as capable of being a rich medium. One Norwegian engineer explains, “Email communication also provides a good log and documentation that can be useful for several purposes. It is very handy to be able to go back in time and find out what was really said. In situations of conflict, email is a good tool, with its documentation to settle things.”

FtF for Persuasion

When people want to persuade others, they use the discrete medium of FtF. Although this study did not measure effectiveness of these strategies, the interviewees were experienced media users. The persuasion literature has a long history of

empirically finding that FtF has greater persuasive impact than mass media (Berelson, et al., 1954; Katz & Lazarsfeld, 1955). It appears that the people in this study are using FtF in a manner congruent with findings from prior research. For example, one salesperson said, “I think personal visits are the most effective way to communicate.” A software consultant said, “FtF has something to do with the chemistry, or the absence of chemistry—and you notice it quickly when you sit around the table, but it could go quite far before you would notice it over the net.” Finally, a chamber of commerce director said, “Of course, getting in the car and going to see somebody—and really, I will do that more if I’m raising money for an event.”

Characterizing Combinations of Media (RQ8)

Social Influences

Now that I have discussed how the specific discrete media are used, I will shift into the use details of specific media combinations. The chi-square analysis for media combinations supported the view that social influences varied across the five most frequently mentioned media combinations. The specific combination that was influenced most frequently by social influences was the computer followed by the Web (23%). People frequently report that they create documents on their computer and post them on the Web. A pathologist explains, “On our Web we have included a case archive...Here we take still photos to [post on the Web and allow us to] consult other pathologists.” A frequent reason that they post this information is to interact with others, thus it is a socially influenced combination.

Reasons Predicting the Use of Combinations of Media:

While I was unable to conduct a chi-square analysis for reasons and combination—there were too few cases for the numbers of cells in the analysis—the frequency data demonstrates several noteworthy differences. First, using the computer followed by the Web was highly skewed toward documentation reasons. I have discussed this combination before and it appears that people post the information from their computers to the Web so they can document and share it with others.

Web for information. The Web is clearly the most frequently mentioned medium in this study. The pervasiveness of using the Web to retrieve and give information in organizational communication raises important implications. Flanagin and Metzger (2001) mention that the credibility of information on the Web is potentially problematic because many Websites do not undergo an external validity check—as is the case with newspapers, books, and magazines. In their study, they did not focus on the kinds of information people retrieve using the Web, but they mention that it is an important area of study. A salesperson in this study explains its value by saying, “There’s just an enormous amount of information. I don’t even think a lot of people understand what’s out there. So I think it’s very valuable.” Examination of the 1081 coded units in the N6 data where the Web and information overlap, reveals three key types of information uses that are particularly relevant to organizational information use: on-the job learning, competitive intelligence gathering, and preparation for meetings.

Learning. People in this study use the Web to learn. These are knowledge workers that are experienced users of media and they know the power of looking-up

information on the Web. This helps them do their jobs better. A manager in an e-learning company explains, “So keeping up is very important, and there’s a lot of good corporate education and e-learning Web-based training.” Also, the primary use of newsgroups by the people in this study is learning. Flanagin and Metzger (2001) considered these as the conversation part of the Web.

Competitive intelligence. Using the Web to gather competitive intelligence is a major theme found in the information category. This category can be considered a specific type of learning, because it is not always easy to differentiate between learning and the type of information people want to learn. People of every job type in this study mention using the Web for intelligence at some point in their interview; many of them use the exact words, “competitive intelligence.” A financial analyst explains, “I think the Internet really provides a bit of a competitive edge for the people who take advantage of the information that’s available.” Several interviewees discuss the ease of accessing press releases over the Web. Although this data has been available through services for many years, now companies regularly post these on their own Websites. The Internet allows organizations a low cost option for controlling information and anyone with Web access can easily find this information. A consumer marketing analyst explains how easily she gets competitive information, “It’s a lot of going out and looking at competitors, or not even necessarily direct competitors, but people who have the same business, to find out how their sites work.” Another mortgage broker says, “We use it a lot for rates, competitive information, Web site reviews, to make sure we have the functionality that our competitor might.” Essentially, this competitive

intelligence can also be considered benchmarking; the information is available, and competitors want to see how they compare.

Preparation. The final major theme found in the information category is the role of the Web in preparing people for meetings. The most obvious examples in the data are when salespeople prepare for meetings with customers. These meetings come in many forms, some of them begin with an email conversation. For example, an engineer explains, “I went to their [an equipment supplier’s] Website. Looked at the equipment to make sure it looked like what I thought it was supposed to look like. And I actually read through their Websites to educate myself a little further, and I sent them an email.”

Taken together, these three reasons for using the Web point to a trend in organizations, the fluidity of organizational boundaries is both increasing the information flow and increasing the expectations of what people know about one another before they actually talk. In all of the examples above, even though people only mentioned the Web in the sentence, they implied a combination where the Web was used first in the sequence. If people expect others to have “done their homework” by using the Web before they actually meet, several things can occur. On the positive side, the meeting can progress more quickly because both parties share some common knowledge. But in the process of creating this expectation, there is now more time involved in preparing for these meetings. Furthermore, if people fail to seek the information on the Web prior to the meeting, their credibility might suffer as a result.

Keep in mind that this information on the Web is not always accurate or current. One interviewee explains how he uses several sources to triangulate information and reach a conclusion. During his interview he explains that he will use the Internet to confirm rumors he has heard about his customers. Not only does he look at the customer's Website, but he looks for articles that have been recently published by that company. He also says that he reaches a conclusion over time because eventually the data convinces him of the veracity of the information as a whole.

While people wanting to give or receive information choose a discrete medium, as discussed previously, when they want to persuade others, they use media combinations. This might indicate more strategy, or mindfulness (Langer, 1989) involved in this process. Persuasion can be considered a higher risk activity because behavior change or control is desired (Petty & Cacioppo, 1981). The experienced media users in this study know that they need to be strategic.

The most frequent combination. When the Web is used and followed by FtF, 37% of the time it is for persuasion and 64% of the time it is for information. This combination is the most frequent one, and deserves further explanation. The people in this study use the Web as a first information-gathering step in this process. When they meet FtF, sometimes the goal is persuasion, and sometimes the goal is information. What is most interesting about this combination is the reasons people give for using it. Salespeople typically talk about visiting a customer's Website to appear more credible when they meet FtF. Engineers speak of researching details to appear more knowledgeable when they talk with others FtF. The Web is used as a preparation step,

and this use works well in the complex process of establishing source credibility.

Beginning with Aristotle, explicated in the work of Hovland and his colleagues at Yale (Hovland, Janis, & Keeley, 1953), and recently tested empirically by McCroskey and his associates (e.g., McCroskey, 1966; McCroskey, & Teven, 1999), source credibility matters in persuasion. The particular dimension of credibility that is likely influenced by this type of media combination is expertise (trustworthiness could also play a role).

FtF then email. Another frequent combination is the use of FtF then email.

Here this combination is used for information only 23% of the time, yet it is used for persuasion 50% and documentation 19% of the time. People in this study feel that when you follow-up a FtF meeting with an email, you can be persuasive. Essentially, reinforcement of message in a textual medium appears to be a persuasive strategy.

Perhaps this also plays a role in our understanding of how people use media in combination to enhance credibility. A small business owner explains how this works and actually helps him get business, “If I email them and send an attachment with a picture of something and I say that I don’t think I really explained this to you quite as well as I need to, so here is a picture that may help you in making your decision a little bit more, I’m not being pushy and it comes across a whole lot better.” Here the “information” serves as a supplement to FtF communication and helps him reinforce his credibility.

Media Used Second in a Combination

As I mentioned in the results section, it is difficult to know if the medium mentioned first is actually where the sequence begins, so I focused these analyses on

characterizing the medium used second in a combination. The most frequently media-used-second are the same six most frequently used discrete media, but their frequency distribution varies slightly. FtF is the most frequently used second medium, followed closely by email and then the Web. When media were used discretely, the Web was used more than twice as frequently as email and FtF.

Media-Used-Second and Influences

When comparing these media-used-second across the three influences, I found that use of paper is influenced by social influences almost twice as frequently as the Web, email, and telephone, and considerably more frequently than FtF or the computer. People are using paper as a follow-up medium because it helps in their interactions with others. They still print things out and give paper copies to others. For example, “And I’ll usually copy [information] out of a catalogue... to give them documentation to validate what I’m saying.” When people use FtF, the computer, or email as a second medium, they do so predominantly because of the traits inherent in those media.

Media-Used-Second and Reasons.

Paper. Media are also used second in a combination for slightly different reasons than they are used first. Paper once again, experiences a striking change in why it is used discretely and why it is used second. This medium is used for persuasion only 7% of the time when it is used discretely, yet that number jumps to 42% when it is used second. Perhaps this finding also links into my previous suggestion that people use these media combinations for credibility reasons. Using paper as a follow-up to another

medium is not only something influenced by others, but it also helps a communicator accomplish persuasion goals.

Email. Email as a second medium also experiences a jump in its persuasive uses from 14% with discrete media to 30% when it is used second. Email, like paper, also has the ability to textually convey information. As a follow-up medium, perhaps people are using email to enhance their credibility as well.

Resolving the paradox of the computer. The computer also experiences a shift from 48% documentation uses when used discretely, and only 11% when used second. The use category that increases when the computer is used second is information (from 26% to 61%). This suggests that when people use the computer with no other medium they are documenting, but as a follow-up medium, it is more useful for information. This helps to clarify a troubling finding that I mentioned earlier: the computer is used for documentation twice as often as it is used for information. Without the knowledge of how computers are used in a more dynamic work situation, this conclusion looked odd. But when we think about documenting as being a first step in using the computer and then retrieving that information from the computer in response to using another medium, our understanding is clarified.

Exploring the Media-Used-Second Group

Cluster analyses are considered a helpful yet exploratory way to examine relationships between variables. In this case, I classified only the six most frequently mentioned secondly-used-media and found a nice way to explain them. The cluster analysis and the MDS plot illustrate how each of the three, two-media clusters, can be

aligned using two different theoretical views. The three clusters were: (a) FtF and telephone, (b) computer and paper, and (c) Web and email. The first cluster was labeled the auditory-enabled cluster because both FtF and telephone have the ability to transmit auditory information. I call the second cluster the textual-personal group because both the computer and paper are controlled primarily by an individual and the information communicated is textual in nature. The final cluster is called the textual-linking group because the Web and email both link organizational members to the outside world and do so through text (see Table 5.2).

Table 5.2

Interpretation of Media-Used-Second Clusters

Media	Cluster		
	Auditory-Linking	Textual-Linking	Textual-Personal
a. FtF	X		
b. Telephone	X		
c. Email		X	
d. Web		X	
e. Computer			X
f. Paper			X

Relating these groupings to the dimensions found in the MDS scaling, the vertical axis represents the degree of connection with others, and the horizontal axis shows the degree of availability of auditory information. This is represented by the following Table 5.3.

Table 5.3

Follow-up Media

The grouping of the six most frequently used media (Web and email; paper and computer; FtF and telephone) can be placed in the following grid that shows how the media characteristic of Textual vs. Auditory forms one axis, and the social influences form the other.

<i>Connection Ability</i>	Media for connecting with others	Textual Linking	Auditory Linking
	Media for personal use	Textual Personal	No instance found
		Textual	Auditory

Media Traits

Explaining the Dimensions of Follow-up Media

Returning to a primary goal of this research, these groupings provide some insight into how media are used as part of a communication process. I claim that simplifying the understanding of how we use media to only consider media in isolation is incomplete. Communication is a two-way process and media are likely used throughout that process. This grid shows how the people in this study chose a follow-up medium. They considered if textual or auditory information needed to be conveyed. They also considered their communication situation and whether they needed to connect with people or rely on media that was detached from immediate contact. The two media found in the textual personal quadrant, paper and computer, were also used less frequently than the other four media. This also might support a view that media combinations are invoked as part of the process of communication. Most of the time, media combinations contain a medium like FtF, telephone, email or the Web, that directly links people.

Exploring Complex Sequences (RQ 9)

I did not statistically test the relationships involving complex sequences—those with more than two media mentioned—because only 17 of the 66 people in this study mentioned them. However, the results suggest that these sequences resemble the frequency distributions across reasons for use found for FtF. Approximately half of the coded data fell into information uses and the other half were persuasion uses. Furthermore, of the six most frequently used media in this study, FtF is the only medium whose uses appear somewhat similar whether it is used discretely or second in

a sequence. FtF is also the most frequently used second medium, and the most frequent combination found in the data is the Web followed by FtF.

To begin to link the complex sequence findings with the trends for FtF use, I will first discuss the reasons that predict the use of FtF. Then I will characterize the media combination of the Web followed by FtF. Finally, I will link these findings back to Paivo's (1990) dual coding theory and present an argument for why FtF might be a type of complex sequence.

Previous Persuasion Findings

The intersection between FtF and persuasion appears in all 66 interviews, so every person uses FtF for persuasion at least once. And statistically I did find that persuasion reasons predict the discrete use of FtF. As mentioned previously, persuasion research has often found that FtF is better than mass media. The experienced media users in this study not only use FtF for persuasion, but they place considerable value on FtF. For example, one engineer said, "I think you build a [business] relationship over a cup of coffee." An entrepreneur said, "And they know that I'm interested enough to fly out to meet them." A salesperson said, "I feel like I'm more effective if I go talk to a person FtF." And a preacher said, "I would suspect that most coffee shops in this town and other towns all decide who's going to be mayor and run for school board, like all other little towns in America." In essence, FtF is prioritized and likely planned when the goal is persuasion.

The strategic nature of using FtF for persuasion is also found in using the Web followed by FtF, the most frequently used combination. As the narratives in the data

suggest, this is often meant to be preparation prior to a FtF meeting. For example, a Norwegian software developer said, “When trying to establish a new customer relationship, it is very tempting, and we often do, access their homepage, to see how they present themselves.” A Web product salesperson says, “The Website is a starting point. It never gets me there until I talk with the folks.” Finally, a marketing person demonstrates the strategic nature of using this type of combination. “When I’m preparing a customized presentation for a customer, I would go on line to their Website, get the look and feel, so that I could use some of their Web page thoughts and graphics in the presentation.” Here people use the Web to gather information and possibly present a more informed perspective when they meet others FtF.

Is FtF a Complex Sequence?

The distribution of these combinations where FtF appears second, when FtF appears alone, and when complex sequences are used, are spread across the uses in a similar way. What if people consider FtF a type of complex sequence? To explain this reasoning, I will return to the literature review for this study and to the work of psychologist Paivio (1990). His work says that using a combination of oral and visual information improves audience interest and recall; two goals present in most persuasion. This combination works because slightly different information is communicated by the different channels and they reinforce each other. In the case of FtF, the auditory channel is the voice, and the visual channel is the non-verbal communication. In a complex sequence, people can use one medium—e.g., email—to provide visual or textual information, another medium—e.g., telephone—to provide the auditory

information, and yet another medium—FtF that provides both types of information. As communicators combine these channels, they are somewhat additive; yet FtF has those two channels as an inherent part of the medium.

I am not trying to say that FtF is necessarily ideal, only that it is capable of providing information by two different channels. As the streaming of audio over the Web continues to grow in popularity, the Web might also be used in a similar manner. There are other media, some found in this study, that have both an auditory and visual channel as part of them—i.e., Webconferencing, PDA, videoconferencing. Perhaps they are also more persuasive than using a medium with a discrete channel like the telephone or email. This also suggests that when FtF is not possible, and persuasion is the goal, perhaps using complex sequences of media will be more effective than simply using one medium. Examination of the media used second findings did show that both paper and text were used more than twice as frequently than when they were a first medium.

Although Paivio's work claims that "auditory" and "visual" are the channels to be combined, prior empirical work found in communication—e.g., Dahle (1953)—examined "oral" and "written." Here the combinations were FtF—defining the "oral" category—and a text was the written channel. More recently, Rice and his associates (2004) also claim that using a mix of media enhances the learning. Combining these text-based findings with the persuasion findings above, text-based media used second are worthy of additional study. Prior research supports the data here that media combinations are used for persuasive reasons more than discrete media.

Using these theoretical views that redundancy via different channels is good for communication (Dahle, 1953; Hsia, 1968; Paivio, 1990; Reinsch & Beswick, 1990; Rice et al., 2004), possibly complex sequences that combine an “oral,” a “visual,” and a “textual” channel will accomplish persuasion goals the best. This is certainly speculation, but one grounded in theory and the frequency data from this study. The data here do not measure effectiveness, but using text-based media second for persuasion was striking in this study. I will elaborate on ways to study these complex sequences in the final section of this chapter.

Limitations of this Study & Opportunities for Future Research

In the final section of this chapter, I will describe the limitations of this study and propose areas for future research. The limitations cover data collection, coding decisions, and the choice of variables. I also provide the top five recommendations for future research. These include: exploring social influences, learning more about using the Web in combinations, utilizing the developed coding scheme, researching overload, and linking these persuasion findings to tangible and relevant organizational outcomes.

Limitations

With every research approach, there are tradeoffs (Weick, 1979). This study is no exception. I begin by explaining some of the limitations inherent in how I chose to approach this study. I will also show how future research might overcome these limitations.

Data Collection

There are limits to the type of data available through the text of an interview. Asking people to articulate reasons and influences for use assumes that people use media for strategic reasons and that they are aware of their reasons and influences. Scholars like Timmerman (1999) have suggested that people use media mindlessly; but measuring this concept is quite difficult. While I do believe some use is mindless, in a work setting, much use will be strategic and if the data is collected carefully, social desirability in responses can be lessened.

Limits of an existing dataset. I knew that deciding to use an existing interview dataset for this study had strengths and limitations. The positive side of studying combinations using this dataset was that all the combinations emerged naturally, in a non-prompted manner. This approach provides a different type of data than many other organizational media studies because most of them begin with a pre-defined list of media to examine. Although this emergence is a strength, it also means that the interviewers asked no questions about combinations to uncover more about when one is better than another, or if the combination actually began and ended as people discussed them in the interview.

Coding Decisions

Sentence as a unit of analysis. Selecting the sentence was also both a strength and a weakness of this study. The biggest strength of using sentences is that it facilitated coding. The biggest weakness is that people do not necessarily complete their discussion of a sequence of media used in one sentence and that the sentences

were actually defined by the person who transcribed the interview. An examination of the actual audio recordings confirmed that the transcriptions were consistent, yet still the sentence definition is not an absolute. There were many sentences and quite often people explained their use of sequences over several sentences. For this reason, this study severely under-reports the occurrence of media combinations. To count as a combination, people needed to mention or reference two or more media in the same sentence. As you will notice in several of my examples here, especially in the section where I discuss the three major information reasons for using the Web, most of the sentences hint at the Web being either a preparation or a supplemental medium that supplies information. This limitation leads me to suggest that the pervasiveness of using the Web in a sequence should be explored in future research. One way to overcome this limitation is to re-visit this same dataset and use a less structured approach to the analysis. If the goal were defined more narrowly—i.e., Why are people using media combinations involving the Web—then a thematic analysis would be highly appropriate.

Mutual exclusivity. The decision to code data into only one of the three influence categories, one media category, and one of the five influences, also is both an advantage and a disadvantage to this research. It was advantageous because without it a content analysis would not be possible because I would violate the assumption of a chi-square analysis, and I do not believe the data could have been reliability coded. With that said, it was also a limitation in this study. If I had coded the data into more than one influence category, I could tell which influences co-occur. The same situation is

found in the case of the reasons. If you read some of my examples of items coded into media traits, you will likely notice that if you expand your thinking beyond the words in that sentence, you can see how the comment might be socially influenced as well. To achieve intercoder reliability, this was a trade-off. It is interesting that even though the two coders used a mutually exclusive coding scheme, the correlation between media traits and social influences was high. In my attempt to make them mutually exclusive, I essentially showed that all the influences coexist in organizational media use.

Collapsing specific information uses. My original plan was to learn much more about different types of information uses—getting information, giving information, collaborating—but these proved too difficult to code from interview data. It is possible that using a carefully defined and limited set of coding rules these data could be re-coded into more specific categories. What I chose to do in the discussion of this study was more of a thematic analysis of one category, the information uses of the Web, and this seemed productive. Another, much more precise way to measure these specific uses is to design a questionnaire with multiple item measures and ask about uses. It makes sense to use the questions and findings from the Flanagin and Metzger (2001) study. But the research here suggests that competitive intelligence be added as an additional uses that is both practical and theoretically relevant to organizational use.

No Outcome Measures Other Than Use of Media

Another limitation of this study is that I did not tie the use of media to outcomes, so I can make no claims about the effectiveness or efficiency of media combinations.

Had I either chosen a different methodology, or entered the interview environment specifically asking about perceived effectiveness, these measures would be included. What I can say is that people experienced with media, use them for specific reasons and are influenced to use them in certain patterns. All I can do is use the data to conservatively speculate and provide some solid description for future research. For example, earlier in this discussion, I suggested that FtF might not be as effective as a complex media combination that included FtF and a “written” medium. I also said that there might be complex combinations that do not include FtF and are just as effective at accomplishing some goals.

Top Five Directions to Expand This Research

To provide direction for pursuing this work further, I have identified the five most promising research areas found in this research. I first discuss how scholars can expand our understanding of social influences in media combinations. Then I elaborate on how to study the role that the Web is playing in media combinations. The coding scheme developed here also has some potential for contribution to the field. In addition, I’d like to see more work in the area of overload and to that end, I suggest a theoretical concept of how it might be studied. Finally, I discuss the role of using media combinations in persuasion attempts.

Further Explore the Social Influences on Media Combinations

Instead of trying to decide which influence theory matters the most in organizational media research, scholars should focus on which medium and media combinations are most inclined to be subject to social influences. Organizational

change is one research area where this finding might be quite helpful. This also applies to the role that media might play in organizational culture, something often discussed in the popular press literature as being a target of change. To see how these concepts relate, I will elaborate on the concept of culture, change, and finally show how using media might help in these processes.

In the 1980s and early 1990s much of the organizational research and many popular press texts touted “organizational culture” as the hot topic of the day. Organizational leaders were told that they could change and mold their cultures to fit their own ideals. This proved more difficult than scholars and leaders expected. Even today, if we peruse the top organizational change popular press texts, we find that there is no lack of recommendations for how change should be implemented, but much of this advice is based on experience and lacks theoretical reasons (Lewis, Schmisser, Stephens, & Weir, under review). For example, Lewis et al. (under review) found that the top recommendations in the popular press books included, (a) incorporate people in all levels of the organization, (b) disseminate information broadly, and (c) leaders must demonstrate support for the change. While the books sometimes suggest using a specific medium to disseminate the information, the persuasiveness of the efforts is rarely discussed. And influence plays an important role in a successful change implementation.

Perhaps the theoretical lens that can be applied here is social influence theory and its derivatives. Many of these large-scale organizational changes are internally focused on their own organization. The findings from this study suggest that social

influences affect media used for internal communication more than they affect media used for external communication. This means that the intranet is used because of social influences. Perhaps leaders, who are advised to actively support the change, are using different media to communicate their support of the change, than the media used to disseminate the information. This concept is supported in Timmerman's (2003) work. Future studies should examine the potential incongruity of using different media to communicate change.

Another use of these social influence findings is how they might be linked to Uses and Gratifications (Katz et al., 1974). I mentioned earlier that while Uses and Gratification is helpful as we attempt to identify the reasons people use media, I also discussed the criticisms—that it is atheoretical. Perhaps a careful look at the literature on social influences can provide that theoretical base to Uses and Gratifications. This is particularly relevant as we study media combinations. The model in Figure 5.1 showed that social influences affected certain combinations more than others. It would be very interesting to link this finding with specific uses and develop a “Socially Influenced Model of Media Uses.”

Learning More About Using the Web in Combinations

Learning more about how the Web is used for information is another area ripe for communication research. It is so tightly embedded in the communication process that while it might seem to be an individual, noncommunicative activity, it is actual an integral part of modern organizational communication. The information retrieved from the Web almost always has been posted by people trying to communicate their message.

People in this study are using the Web to learn and for competitive intelligence gathering.

Learning. As a scholarly community, we know very little about how organizational members are using the Web as part of their communication processes. This study suggests that they are using it as one step in their on-the-job training or just-in-time learning. This might be effective and it might be problematic. If people are finding correct information quickly, the Web seems like an ideal medium. Furthermore, previous research has shown that people use newsgroups as a productive just-in-time learning source (Browning et al., 2004). But if the information is of questionable veracity, what are the ramifications for the organization? Should organizations be monitoring the information people gather on the Web? Should they be training their knowledge-workers in how to use search functions and how to evaluate Web-based information? When information retrieved from the Web is incorporated into organizational documents—e.g., PowerPoint presentations. Should that material be cited or checked for copyright clearance? These are all questions that can be addressed by future research in this area.

Intellectual property. This study also shows that experienced media users are gathering competitive intelligence through publicly-available Websites. Because organizations have only used Websites for the dissemination of information for less than the past decade, many questions emerge for future research. First, how has the availability of information changed business? Are organizations aware that their competitors access their information regularly? If so, have they assessed the tradeoffs

of sharing information for their customer's use versus giving competitors easy access. Finally, are there organizations that deliberately post inaccurate information to deceive their competitors, and if so, how does this affect their customers? These all represent important questions as we continue researching media combinations.

Using the Coding Scheme Developed Here for Future Research

As we continue studying how organizational members used media, the coding scheme developed here might be helpful. First, researchers should be aware that coding semi-structured interview data is difficult and using a more structured interview schedule will help coders achieve reliability much more quickly. The distinctions between influences are also difficult to separate, but the reasons and media categories work well.

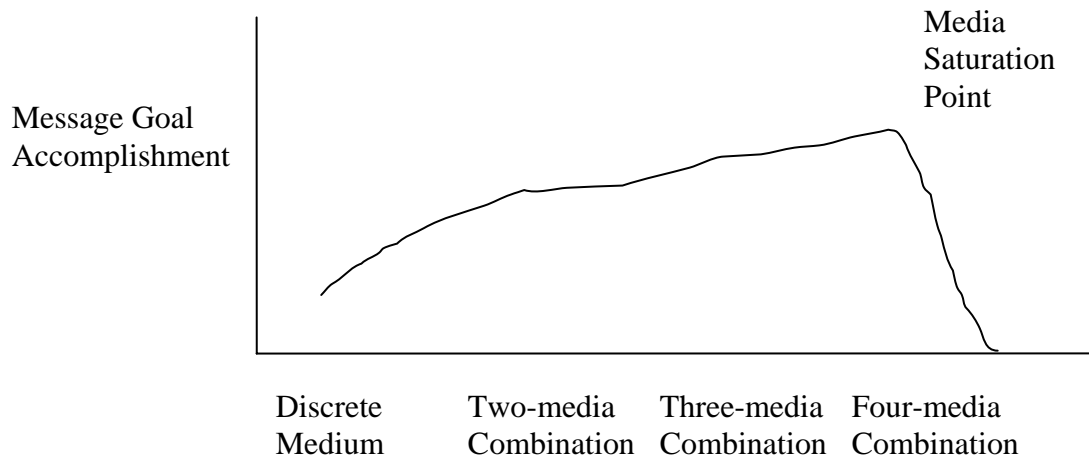
Finally, there are several things I discovered during the coding that can help future research. In this interview data about media, people discussed the media uses of others quite frequently, 12% of all the coded data. They also spoke negatively about media in 11.8% of the coded data. While these categories were not of interest to this current study, they might provide some interesting insight into media use. Perhaps people talk of how others' use media as a way around the pressure to provide a socially desirable response. They might also talk of others' use when they themselves do not use that particular medium. Linking this set of codes with social desirability concepts could prove insightful. We might also study why people say a medium is bad in certain circumstances. Perhaps this category simply represents a reverse coding of how they use media, but it might provide some additional insight into actual media use.

Finding the Media Saturation Point

The next recommendation for future research concerns the barrage of messages many organizational members receive today. There is a fine line between persistence and overload. People might be able to follow-up too much and cause a communication target to actively ignore them. As we continuing studying the use of media combinations, it is important to remember that there is likely a limit to the number of sequential media that we can use before we cause the other person to shut down. For my conceptual representation of this perspective, see Figure 5.3.

Figure 5.3. Conceptual Representation of Media Use Optimization and Overload.

As media are combined they help accomplish communication goals until the media saturation point is reached.



In this figure, I propose that depending on the reason that media are being used, each subsequent medium added to the communication attempt might marginally enhance the goal accomplishment, until the media saturation point is reached. At this point the target of the communication attempt—also the ultimate receiver in this communication process—becomes overloaded with information and potentially ceases to participate in the communication process. Broadbent's (1958) original claim that people become overloaded when they receive information from multiple channels might not be completely incorrect. Even though scholars have shown that this is not the case with simple two-channel situations (Hsia, 1968), in real, process-oriented communication attempts, there is likely a media saturation point.

Take, for example, the advertising industry. Today, people receive so many messages through a variety of mass media outlets, there is much more talk about message ordering and placement of those messages (Brunel & Nelson, 2003). Advertisers typically want to be in the first position of a magazine or a commercial sequence. Yet the research that provides advertisers with advice in how to place something like commercials on TV is far from an absolute science and often suffers from conflicting findings (Broach, Page & Wilson, 1997).

In addition to the overload literature, the theoretical and empirical research on primacy—the first mover advantage—and recency—the last thing occurring in a sequence—might prove helpful (Cronwell, 1950; Hovland & Mandell, 1957; Lund, 1925). This literature is vast and spans relevant issues like organizing information for recall, structuring persuasive arguments, and order-effects type theories. Even after

decades of research, the findings are by no means clear. Yet if thoroughly researched, it might provide considerable guidance in how to order a sequence of media. For example, is it best to begin a sequence with FtF, establish that strong relationship and then people are more willing to engage in on-going email conversations? This has been recommended in prior research (Hiltz, 1984). Furthermore, several people in this current study made that claim. Is email becoming overused to a point that people are simply ignoring all email, regardless of whether it is a first, second, or third communication attempt? These are complex questions that we have yet to study, especially in the context of using media combinations.

The practical applications of overcoming overload concerns are far-reaching because most knowledge workers have found at least some of their messages being ignored. The reasons for this behavior are likely diverse, and in a dyadic situation, overload is a probable outcome of using many media combinations.

Toward the Development of Media Succession Theory

Perhaps the most promising set of findings from this study are how we use media and media in succession to persuade. At different points in time, everyone needs to persuade others, but the success and livelihood of people like salespeople, consultants, and even CEO's and Academic Deans, critically depend on their ability to persuade. Currently, the advice is "Use FtF," but is that complete advice? Rarely is persuasion accomplished in one interaction; media combinations are likely involved.

This type of study is particularly relevant in organizational communication, considering how many organizational members need to persuade others. Regardless of

an individual's job role, persuasion matters when it comes to handling managers, coworkers, and certainly external clients. What I develop next, is the most promising avenue, built from this current research, that can highlight persuasion as an important area of study in organizational communication scholarship.

Media to help with source credibility. The first way to study how media are used in succession is to see how media help people enhance their own source credibility. This is different from researching the credibility of information on the Web, as suggested by Flanagin and Metzger (2001). This research might help organizational members appear more expert and organized—two concepts linked to enhancing source credibility (Hovland et al., 1953; McCroskey, 1966). It follows that theoretical notions of impression management might be accomplished using combinations of media as well. O'Sullivan (2000) developed a model that explains how media can be used strategically for impression management. Of particular interest in this situation is his notion of “openness” vs. “closedness” and how people can use media to manipulate the “amount, nature, and timing” (O'Sullivan, p. 407) of their communication.

We have no research that indicates if we should use FtF and then follow up with an email, because, as suggested by several people in this study, email seems less pushy. We also do not know how people can best use the Web for research to enhance their personal credibility before they meet FtF or have a telephone call. We also do not know if we can use a combination of media to accomplish the same persuasion objectives in times when FtF is impossible. All of these questions are both practical and will provide

insight into how media affect the communication process, especially when communicators are geographically dispersed.

Although this research points to the value of using media combinations for persuasion and provides some insight into specific combinations, we need more research to link these combinations to effectiveness and efficiency. I recommend conducting a set of controlled experiments that help us actually measure effectiveness of combinations used for persuasion. Efficiency also matters to many people involved in persuasion attempts. Another helpful experiment will compare sequences of media use and determine how many media are needed to accomplish objectives.

There are two key considerations for this research line: defining persuasion and timing of subsequent media use. I recommend using the compliance-gaining literature, a more applied version of the social power research (French & Raven, 1960) as a way to segment different persuasion goals. I would also like to see perceived effectiveness measured from both the sender and receiver's perspective. Barry and Fulmer's (2004) theoretical work on media adaptation in dyadic organizational influence attempts might provide a useful framework to integrate persuasion and media. A second area of consideration is timing of the use of subsequent media. For example, have you ever sent an email request to another person and then asked yourself how long you should wait before you follow-up with that person? Furthermore, should you send another email, or should you try a telephone call or FtF. While the importance of follow-up is found in virtually every sales and persuasion text and training manual (e.g., American

Management Association, 1993; Burg, 1991; Cialdini, 2001), there are rarely discussions of timing and the specific media used for following up.

These five directions for future research build from the findings of this current study. While the research here is fairly exploratory and descriptive, it provides a nice justification for why media combinations matter to people in organizations. It is my hope that people can use this descriptive and predictive data to help construct additional studies that unravel combinatorial media use.

Conclusion

Is technology that potential friend—or advantage—that can help people accomplish more from their organizational life? It certainly plays a key role in viewing communication as a process. It is time to move beyond studying media use from a lowest common denominator approach—one medium for one task—and create a more dynamic understanding by examining media combinations. Perhaps we can find ways to use combinations of media to accomplish persuasion goals in the same way that FtF is viewed as the best option today. This is a relevant consideration as we note that “there is a growing consensus that micro-electronically based information technologies are altering the way we live, work, communicate, and organize our activities” (Orlikowski & Barley, 2001, p. 146). As we become more global and use media to communicate virtually, a process-view of communication is more likely to help us succeed and manage these rapid changes.

APPENDIX A

Interviewee number	title	e/i	m/f	ent/est	small/big	pro/service	man/non	fix/mobile	u/n	company type	# text units	# codes	% coded	# nodes in doc
1	prof/consult	e	m	est	small	service	manager	fix	n	University	285	97	0.34	19
2	CFO of bank	i	f	est	big	product	manager	fix	u	Bank	857	211	0.25	20
3	CEO	e	f	est	big	product	manager	fix	n	Fish Farming	276	90	0.33	27
4	marketing coord-	e	m	est	big	product	non	fix	u	Software	466	86	0.18	19
5	production	I	m	est	big	service	non	fix	u	Printers	403	98	0.24	24
6	salesperson	e	f	entrep	small	product	non	fix	u	E-learning	530	67	0.13	24
7	marketing	e	f	entre	small	sevice	non	fix	u	Software	222	63	0.28	19
8	marketing	e	f	entre	small	service	non	fix	u	software	399	70	0.18	16
9	sales	e	f	entre	small	product	non	fix	u	R-learning E-learning	433	106	0.24	18
10	sales manager marketing	e	f	entrep	small	product	manager	fix	u	company Software	171	41	0.24	18
11	manager	e	m	est	big	product	manager	fix	u	Development	254	60	0.24	23
12	salesperson	e	m	est	big	product	non	mobile	u	Semiconductor	721	192	0.27	30
13	procurement	e	m	est	small	service	non	fix	u	Software	316	60	0.19	20
14	manager	e	m	entrep	small	service	manager	fix	u	Portfolio-lend	178	40	0.22	14
15	hardware sales hardware	e	m	est	big	product	non	mobile	u	Hardware	139	33	0.24	17
16	engineer	i	m	est	big	product	non	fix	u	Semiconductor	981	179	0.18	26
17	ceo	e	m	entrep	small	service	manager	fix	u	Fin-planner	558	97	0.17	19
18	intranet-devel	i	f	est	big	service	non	fix	u	Entertainment	238	105	0.44	29
19	technical sales	i	m	est	big	product	non	fix	u	semiconductor	980	169	0.17	31
20	operations	i	m	est	small	service	manager	fix	u	Internet-tele	202	46	0.23	24
21	VP	e	m	entrep	small	product	manager	mobile	u	E-learning	1050	309	0.29	32
22	business owner	e	f	entrep	small	product	manager	fix	u	Retail	460	69	0.15	20
23	artist	e	f	entre	small	service	manager	fix	u	Photography	505	129	0.26	24
25	software eng.	i	m	entrep	small	service	non	fix	u	Consultant Mgmt	613	82	0.13	23
26	consult	e	f	est	big	service	non	mobile	u	consulting Water	285	46	0.16	17
27	owner	e	m	entrep	small	product	non	fix	u	purification	426	123	0.29	31
28	consultant chamber of commerce	e	f	est	big	service	non	mobile	u	Consulting	1090	211	0.19	26
29	director	e	f	est	small	service	non	fix	u	City agency	590	147	0.25	23
31	software eng.	i	f	est	large	product	Non	fix	u	Computers	154	24	0.16	12
32	preacher	e	m	est	big	service	manager	fix	u	Church	670	62	0.09	22

33	admin asst	i	m	est	big	service	non	fix	u	Educational Administration	557	116	0.21	20
34	lawyer	e	f	entrep	small	service	non	fix	u	Lawyer	750	184	0.25	23
35	archivist	i	f	est	small	service	manager	fix	u	library	953	184	0.19	33
36	software eng.	i	m	est	big	product	non	mobile	n	Software development	149	90	0.60	21
37	software eng. help desk	i	m	est	big	product	non	mobile	n	Software development for	251	92	0.37	19
38	engineer	e	f	est	big	product	non	fix	n	Software for on-line banking	136	50	0.37	18
39	software eng.	i	m	est	big	product	manager	fix	n	Software for banking industry	133	59	0.44	15
40	web page development	e	f	entrep	small	product	non	fix	n	Web page service for fish industry	107	56	0.52	18
41	sales	e	m	est	small	product	manager	mobile	n	Accounting software	217	108	0.50	24
42	cons to eng.	i	m	est	big	Service	non	fix	n	Govt. software dev	125	44	0.35	20
43	software eng.	i	m	est	big	product	non	fix	n	Govt. software dev	144	43	0.30	21
44	web design sales	e	f	entrep	small	product	non	fix	n	Web page service for fish industry	159	31	0.19	15
45	software eng.	i	m	est	big	product	manager	fix	n	National registry - govt.	165	69	0.42	19
46	manager	i	m	est	big	product	manager	fix	n	On-line private internet	210	55	0.26	22
47	compet int.	I	m	entrep	big	service	non	fix	n	Telecom	141	49	0.35	21
48	salesperson	e	m	entrep	small	product	non	mobile	n	E-learning software	193	54	0.28	22
49	cons to eng.	i	m	est	small	product	non	fix	n	Software development	159	106	0.67	27
50	salesperson competitive intel	e	m	est	big	product	non	fix	n	Hardware and software developmnet	147	55	0.37	19
51	intel	i	m	entrep	big	service	non	fix	n	Cellular phone service	167	69	0.41	17
52	eng	i	m	est	big	product	non	fix	n	Software development	157	92	0.59	23
53	software eng.	i	m	est	big	product	non	fix	n	Software to banking industry	159	86	0.54	20
54	director mkt	e	m	est	big	product	manager	fix	n	Soft and	123	55	0.45	26

										hardware devt				
55	human resources energy consultant	e	m	est	big	service	non	Fixed	u	Internet-co Energy office for Norway	249	62	0.25	14
56	consultant	e	f	est	big	service	non	fix	n		202	69	0.34	24
57	pathologist	i	m	est	big	service	non	fix	n	Hospital Software that maps org. compet.	313	100	0.32	23
58	marketing manager	e	m	entrep	small	product	manager	mobile	n	Software development	243	26	0.11	14
59	programer	e	m	entrep	small	product	non	mobile	n		295	87	0.29	24
60	pathologist	i	m	est	big	service	non	fix	n	Hospital Software development	303	102	0.34	25
61	software eng. IT	i	m	est	small	product	manager	fix	n		390	85	0.22	22
62	person/biologist	i	m	est	big	product	non	fix	n	Fish Farming University/elearning	322	53	0.16	24
63	administrator	i	m	est	big	service	non	fix	n		388	127	0.33	31
64	broker	e	m	entrep	small	service	manager	mobile	n	Stock company	369	51	0.14	20
65	farmer	e	f	est	small	products	owner	fix	n	Farm	505	129	0.26	23
66	teacher	i	m	est	big	service	non	fix	n	University	332	155	0.47	28
67	farmer	e	m	est	small	product	owner	fix	n	Farm	144	28	0.19	20
68	Web page design	i	m	est	big	service	non	fix	n	University	343	95	0.28	29

APPENDIX B

Final Coding Rules & Definitions

For each incident (sentence), you can select up to one code for each of the following four parts of the research model: Media used, Influences, Uses, and Decision-Making criteria.

Before defining each of these four major areas, let's list the rules we use for coding.

Defining incidents

- We code incidents at the sentence-level. Sentences are defined as having a noun and a verb (so something identified as "Yes." does not count as a sentence). N6 will identify these for us.
- If the interviewer interrupts the interviewee with an Uhm, I see, or any other nudging comment, this should be ignored when determining if something is a sentence. We will use N6 as the guide to help us identify these sentence units of analysis.
- Always begin the code identification with the interviewee's response, even when clarity is added by including the interviewee's comment. We can always return to the transcript, and this will maintain clear starting points.

Placing the incident into one or more of the four major categories.

- For the incident to count as a codeable piece of data, it must include mention of the media used. For example, if a statement demonstrates an excellent influence, but doesn't relate to media use, it is not considered a codeable part of this research project.
- When a statement contains a reference to a media that was mentioned in an earlier sentence (it, them, etc.), the coder should look back in the transcript to identify the media. You can go as far back as needed, but if the media is not clear, do not code that incident.
- Never code the same incident into more than one subcategory of the major four parts of the research model. This means that one incident can have a maximum of four codes, one in each of the four parts of the research model. This maintains mutual exclusivity.
- "Other" category. While it is important to place the data into categories, when the statement is unclear, and the ambiguity is not resolved by choosing multiple influences/media/uses, the other category is most appropriate.
- Negative Comments. Often people will say that a media is not good for a particular use. Obviously these comments cannot go in the same category as positive uses, so these will go in a bulk category called Negative media, negative influence, and negative uses. This means that all the comments saying a media is not good will be in this category. This category might be further analyzed.

- Reporting on how others use media. Often people say that other people they know use media a certain way. When they are not talking about their own personal use, code that into the category of others' media, influences, and use. This is treated the same way as the negative comments. This category might be further analyzed.
- How much to read into statements. This is likely the make or break consideration for coding. Focus on what is explicitly said in the sentence. When in doubt, don't code it.

Media Used

In this category, you will code the medium they say they use. Keep in mind that the reason they use that medium will also be coded in the next section of this coding document. They might say that they use one medium followed by another one. In that case, code it only as multiple media. Everything in this category will be re-coded at a more detailed level after the first pass is complete.

<u>Media mentioned</u>	<u>Definitions</u>	<u>Examples</u>
1. Face to Face (this is a default category)	Any real-time interactions in the physical presence of the other communicator. For a meeting to be coded elsewhere they must say an online-meeting or a telephone meeting.	We met in the hall, we met in the office, I visited with her at her home
2. Telephone (this is a default category)	Mentions of using the telephone to talk to another. Not a mobile or cell phone.	I called him. She phoned me. We talked on the phone.
3. Mobile phone- text messaging	Mentions of using mobile or cell phones. This does not include text messaging.	Cell phone, mobile phone
4. Text messaging on a mobile phone	Mentions of sending a text message via a mobile phone.	SMS
5. 2-way pager	Text-only device.	I used a pager
6. Voicemail	Mentions of leaving messages on electronic voice boxes	I left a voicemail.
7. Email	Specifics mentions of sending or received electronic mail.	Email, I sent mail also counts unless there is a direct reference to paper mail.
8. Internet	On-line Access. Using the Internet/Web for any function except email. This is because most people call email, email. This is not intranet!	These are the types of terms they will use that qualify the incident for this category: Web, Internet, Newsgroups, Search engines, Extranet
9. Computer applications	Off-line Access. Mentions of software applications that run on a computer. This does not include email programs or the	PowerPoint, Accounting software, Word Processing, Managing data via Excel. Creating reports.
10. Intranet	Specific mentions of intranets,	intranet

11. Personal Digital Assistant	info inside their organization. Multi-functional device capable of sending email, storing contact information, and possibly accessing the Internet	Palm Pilot, PDA. If they say “ I use my PDA to send an email” don’t code it here. It goes in multiple media.
12. Fax	Fax	Fax
13. Paper	Specific mentions of using paper in reports, documents, hardcopies, signature materials..	Paper, hard copy. Reports do not go here. They go under computer applications.
14. Web conference	Specific mentions of Web conferences that combine one or more of the following: audio, video, text, visuals	Web conference, Web seminar.
15. Video conferencing	Specific mentions of video conferencing.	Video conferencing
16. Other media	Any media not covered by the categories here.	If it does not clearly fit in another category, put it here.
17. Multiple media	Mentions of using multiple media, combinations of media, and using one media to access another one.	I use my PDA to access email. I use voicemail and text messaging. I use email then I call them to follow-up.
18. Negative report of media used	Any mention that a media does not work, is bad, they don’t use it.	Fax is dead. Email doesn’t work for negotiation.
19. Report of media used by others	Specific mentions that other people (and not the interviewee) use a media in a certain way.	My salespeople use FtF. My friends all use email. BUT If they say my friends all use email, so I do too, that is NOT coded here because her own use was also reported. “We” use email does not go here.

Influences – “I use a medium because..”

For each incident you may code no more than one influence. Your options are 1) media traits, 2) individual differences, 3) how others influence use, 4) multiple influences, and 5) other.

1. Media Traits

Definitions

How the characteristics of the medium affect media use.

Portability or a media how quickly a medium facilitates bi-directional communication

whether people can edit their message before it is communicated to others

the ability to review and reprocess information

the idea that a medium itself sends a symbol or multiple symbols.

media can facilitate multiple conversations at once

General theories (media richness)

Examples

Take it places

Any discussion about time delays in getting feedback, or the importance of reaching someone. Speed

Mentions of advantages of asynchronous media that allow people time to compose messages

Mentions of documentation, cya, filing of documents for future use

Mentions of a medium being associated with a given meaning. Example: FtF means you care, Email means quick. Perceptions associated with a given medium.

videoconferencing can connect many people from multiple locations and transmit video and audio in a near-simultaneous environment

2. Individual Differences

Internal forces. How an interviewee’s preferences affect media use.

Expressions of personal preference and mentions of media they like. Dislikes are

Mentions of I like email the best, or given my way, I’d always communicate using

	coded as negative reports of media use. Interviewees personal experience with the medium	FtF. These are both examples. Everyone in this dataset is an expert media user, but if they talk about this, put it in this category.
<u>3. How others influence use.</u>	External forces. If other people are influencing the media choices at all, put it here. Social influences: Co-workers, customers, and people who influence media use. Proximity: Physical distance between communicators Perception that the receiver is either available that that given time or unavailability	(General theories – social influence, critical mass) Mentions of using a medium because a co-worker or customer does is one example. Mentions of using a medium because their recipient is in another time-zone, or location. Mentions of catching people in their offices or at their telephones. This is close to a media characteristic.
<u>4. Multiple influences</u>	Any time they say that more than one of the three medium, personal, or others affect their use of media.	I use the phone because it is my favorite and my friends use it.
<u>5. Other influence</u>	If an influence does not fit into one of the four categories above, put it here.	
<u>6. Report of influences on others' uses</u>	Specific mentions that other people (and not the interviewee) use a media in a certain way because of this reason.	My salespeople use FtF because it works with customers. BUT If they say my friends all use email, so I do too, that is NOT coded here because her own use was also reported. “We” use email does not go here.

Uses & Considerations.- For what purpose; or, This medium allows me to do X.

Code no more than one of the following use categories for each incident: information needs, social needs, control needs, entertainment needs, multiple uses, and other needs.

<u>1. Information uses</u>	Definitions	Examples
	Get Information	I need to look for data on X.
	Share information, follow up	
	Learning is generating ideas, learning about oneself and others, and learning how to do things.	I need to get information so I can learn how to do my job better.
	Problem solving means to solve problems, to make decisions, and to contribute to a pool of information. Involving others	I use FtF to make decisions. I use newsgroups to contribute information.
<u>2. Social uses</u>		
	Bonding: to feel less lonely and to have something to do with others.	Email makes me feel less lonely
	Relationship maintenance is also social dimension and it means to get to know others, to provide others information, and to stay in touch.	I use email to keep in touch with my friends. I use FtF to get to know people.
<u>3. Persuasion uses (must be explicit)</u>	Any specific mentions of using media to control others or situations.	
	to negotiate, bargain, or get someone to do something for you.	Email is very good for convincing people to give you the sale.
	to impress people or feel important.	I use mobile phone to impress people.
<u>4. Entertainment uses</u>		
	to play or have fun	Mentions of using media to

	Leisure is to be entertained, to relax, and to pass time when I'm bored.	play This is more of a gratification. I like to use the Internet to relax.
<u>5. Documentation and Organizing uses</u>	Mentions of using media for the purpose of organizing information.	Creating an audit trail, documenting, having back-up redundancies,
<u>6. Multiple uses</u>	Mention more than one of the uses above.	Email is great for keeping in touch with friends and to pass time when I am bored.
<u>7. Other reasons for use</u>	Any uses that do not fall clearly into one of the five needs above.	
<u>8. Reports of others' uses</u>	Specific mentions that other people (and not the interviewee) use a media in a certain way because of this reason.	My salespeople use FtF because it works with customers. BUT If they say my friends all use email, so I do too, that is NOT coded here because her own use was also reported. "We" use email does not go here.

<u>This will be coded on an interview level – not a sentence.</u>		
<u>Organizational environment</u>		
<u>1. Large, established vs small, entrepreneurial</u>	Large organizations are considered those that have over 50 employees and have been in business for over 5 year. Small organization are those with	Microsoft – large Start-up training company – small

	fewer than 50 employees and have been in business for less than 5 years.	
<u>2. Products vs services</u>	Product organizations manufacture and sell a tangible product. Service organizations do not manufacture a product.	Semiconductor company – Product Consulting company – service
<u>3. Gender</u>	Male or Female	
<u>4. Job Role</u>	Do they communicate primarily with others inside their organization (intra) or others outside their organization (inter)?	Inter – sales, consulting, entrepreneurs building their business. Intra – internal organizational support folks, programmers working little with external clients, teachers
<u>5. National Culture</u>	Are they from the US or Norway	
<u>6. Fixed vs. mobile</u>	Do they work primarily in one location with others from the same organization? If so, fixed. Mobile workers are located away from a central office.	
<u>7. Manager vs. nonmanager</u>	Do they manage people? If so they are a manager, if not, they are a nonmanager.	

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