

Affective and Cognitive Reactions to Narrative Versus Statistical Evidence Organ Donation Messages

Jenifer E. Kopfman, Sandi W. Smith, James K. Ah Yun,
and Annemarie Hodges

ABSTRACT *Persuasive health messages have been examined for their effectiveness, but few studies have explored the cognitive and affective reactions to these messages. The goal of the present research was to gain insight into the cognitive and affective reactions to statistical evidence and narrative persuasive messages about organ donation in order to determine why these different types of evidence are persuasive. The influence of prior thought and intent about organ donation on these reactions also was explored. Cognitive reactions examined included total, positive, and negative thoughts about organ donation, message ratings, and assessments of causal relevance, while affective reactions examined included positive and negative emotions about organ donation and anxiety. Results indicated a main effect for evidence type such that statistical evidence messages produced greater results in terms of all the cognitive reactions, while narratives produced greater results for all of the affective reactions. A main effect for level of prior thought and intent regarding organ donation indicated that this variable influences both cognitive and affective reactions to persuasive organ donation messages. No interaction effects were found to be significant. In terms of the Heuristic Systematic Model of persuasion, statistical evidence messages were found to enhance both systematic and heuristic processing while narratives were found to enhance only heuristic processing. Implications for health communication practitioners are discussed.*

A great deal of the research on persuasive messages in the health domain has examined the effectiveness of various forms of these messages. Many researchers have compared the effectiveness of implicit versus explicit conclu-

Jenifer E. Kopfman (Ph.D., Michigan State University) is Assistant Professor of Communication at the University of Toledo, Toledo, OH. Sandi W. Smith (Ph.D., University of Southern California) is Assistant Dean of the College of Communication Arts and Sciences and Associate Professor of Communication at Michigan State University, East Lansing, MI. James K. Ah Yun (Ph.D., Michigan State University) is Assistant Professor of Communication at California State University, Sacramento, CA. Annemarie Hodges is a graduate student in the Department of Communication at Michigan State University. An earlier version of this paper was presented to the Health Communication Division at the annual meeting of the Speech Communication Association in New Orleans, LA, November 1994. We gratefully acknowledge helpful comments at various stages of this manuscript from Kathryn Greene, David Seibold, and two anonymous reviewers. Correspondence concerning this article should be addressed to Jenifer E. Kopfman, Department of Communication, University of Toledo, Toledo, OH 43606. Electronic mail may be sent to jkopfma@pop3.utoledo.edu.

sions in messages (for example, see McGuire, 1969; Linder & Worchel, 1970), and Burgoon (1995) has examined different forms of language that leads to the persuasiveness of a message. Many studies have tried to determine the level of fear that creates optimally persuasive messages (Boster & Mongeau, 1984; Mongeau, in press; Witte, 1992), while others have tried to determine whether one-sided or refutational messages best accomplish the persuasive purpose (Allen et al., 1990; Hale, Mongeau, & Thomas, 1991; Smith, Kopfman, Morrison, & Ford, 1993). Different types of messages have been employed in each of these efforts, yet the evidence provided in these messages typically can be classified into one of two categories: statistical evidence or narrative evidence. Both of these evidence types are used widely in the public health domain, yet few empirical investigations of cognitive and affective reactions to these types of evidence have been undertaken. The present study investigates cognitive and affective reactions to statistical evidence and narrative persuasive health messages designed to encourage people to carry signed and witnessed organ donor cards. The influence of prior thought and intent about organ donation on these reactions also is explored, and the results are explained in terms of the Heuristic Systematic Model of persuasion (Chaiken, Liberman, & Eagly, 1989).

Organ Donation Messages

A critical need for organ donors exists in the United States today. The number of persons waiting for transplant organs to become available has reached an all-time national high of 41,385, while the number of actual organ donors remains quite low at less than 5,000 per year (Manning, 1995). Although many of the people who die each year are considered potential organ donors, less than one-fourth of them actually become organ donors (Waiting for Life, 1993). In order to increase this number, it is necessary first to increase the number of persons who carry signed and witnessed organ donor cards.

Nationwide polls suggest that about 50 percent of Americans indicate that they are willing to have their organs donated after death, but only an estimated 20 percent of the population carry signed and witnessed organ donor cards (Gallup Poll, April 1987). The population can be divided into three segments: individuals who have signed and witnessed organ donor cards, those who report willingness to donate organs but do not have signed and witnessed cards, and those who report little or no willingness to donate organs. Since the first group has already performed the desired behavior, these last two groups tend to be the targets of persuasive efforts to increase the number of potential organ donors.

In order to reduce the shortage of transplant organs, those individuals who report willingness or intent to donate organs but do not have a signed and witnessed donor card must be persuaded to carry such a card, and those who report little or no intent must be persuaded to increase their intent to donate. To accomplish these types of persuasion, researchers recommend the provision of information designed to overcome fears and misunderstandings associated with organ donation, as typically is found in any literature on organ donation (Cox, 1986; Lenehan, 1986; Marshall, 1979; Osborne & Gruneberg, 1979; Stark, Reiley, Osiecki, & Cook, 1984; United States Department of Health and Human Services, 1986, 1990). An individual's level of prior thought and intent to sign an organ

donor card has been shown to have a significant impact on outcomes associated with these persuasive messages regarding organ donation.

Smith and her colleagues have found that prior thought and intent about organ donation have a strong influence on belief and behavior change, on the cognitive processing of the persuasive messages, and on fear elicited when reading these messages (Smith, Morrison, Kopfman, & Ford, 1994; Smith, Kopfman, Morrison, & Ford, 1993). Individuals high in prior thought and intent were likely to change their beliefs about the need for organ donation in a positive direction after reading a persuasive message, and they were more likely to remove brochures containing actual organ donor card stickers. Those low in prior thought and intent perceived the same messages to be significantly more fear- and anxiety-producing than the people high in prior thought and intent, and the low prior thought and intent individuals tended to exhibit negative belief change and a low likelihood of removing the brochures with donor cards. Given that prior thought and intent has such a significant influence on the impact of persuasive messages, it is crucial to examine its influence on individuals' reactions to organ donation messages.

Much of the previous research on providing information about organ donation has investigated persuasive messages in the form of statistical evidence messages (Winkel, 1984; Ford & Smith, 1991; Smith, et al., 1993, Smith, et al., 1994), but other literature (Harris, Jasper, Shanteau, & Smith, 1990) suggests that persuasive messages in narrative form also can be effective persuasive tools. The present research examines reactions to both statistical evidence and narrative organ donation messages in an effort to understand the cognitive and affective aspects that may make these different types of evidence persuasive to the two segments of the population without signed and witnessed organ donor cards.

Evidence Type

Statistical Evidence Messages. Statistical evidence messages commonly contain a major premise and supporting evidence for the major premise in the form of empirical statistics and facts presented as a summary of a larger number of cases (Allen & Preiss, 1997). Typical persuasive messages in the domain of organ donation have followed this form (Winkel, 1984; Ford & Smith, 1991; Smith, et al., 1993; Smith, et al., 1994). Winkel (1984) found that refutational messages, which present negative consequences of organ donation accompanied by the factual counterarguments to those consequences, were more effective in persuading people to fill out donor cards than one-sided messages containing only statements of positive consequences. Ford and Smith (1991) found results similar to those in the Winkel (1984) study when comparing one-sided and refutational messages, but Smith et al. (1994) found no difference due to sidedness, such that both types of statistical evidence messages were successful in persuading respondents to obtain organ donor cards. Thus, statistical evidence messages have been shown to be effective in persuading people to become potential organ donors, but other research has examined the effects of narrative messages with identical purpose.

Narratives. Narrative, or story, form is intuitively appealing to humans, as we are all essentially storytellers and avid story recipients. A narrative can be defined as "an internally coherent discourse unit whose elements and their sequencing evidence canonical form" (McLaughlin, 1984, p. 185). This canonical form

typically contains a setting and an episode (Rumelhart, 1975). The episode contains "superordinate goals, plans, acts, and outcomes" (McLaughlin, 1984, p. 195) and usually concerns a protagonist who attempts to reach a goal, often encounters obstacles, with certain immediate consequences, and longer-term reactions to the goal-oriented action (Mandler, 1982). Bruner (1986) similarly describes the canonical form of a story as a progression through "steady state, breach, crisis, and redress" (p. 21) from which the story recipient seeks to understand how plight, character, and consciousness are integrated. Story grammarians have found that this canonical form approximates the way in which stories are stored and represented in memory (Rumelhart, 1975; Stein & Glenn, 1979).

Narratives are powerful and compelling. They capture the recipient's imagination and enlist him or her in the "performance of meaning under the guidance of the text" (Bruner, 1986, p. 25). Stories can communicate a large amount of information with few words because at an early age, we are taught how to process and make sense of information presented in narrative form. "Stories engage widely shared cognitive routines that virtually any member of society can use to make elegant judgements about a described behavior or situation" (Bennett, 1978, p. 1). In persuasion, narratives typically provide easily understood case histories or examples as proof that the communicator's major premise is true (Allen & Preiss, 1997).

In the area of organ donation, narratives about individuals who have become organ donors have been shown to be quite persuasive. Skowronski (1990) found that a video of parents who decided to donate the organs of their deceased son enhanced both willingness to sign a donor card and actual card-signing behavior. Subjects in this study also demonstrated a significant positive attitude change regarding organ donation. Research by Harris, Jasper, Shanteau, and Smith (1990) found that subjects who read narratives about deceased hypothetical individuals were highly likely to recommend donation of the fictional person's organs regardless of their own beliefs about donation. Thus, narratives about organ donation have been shown to be effective persuasive tools, as were statistical evidence messages, but research comparing messages using these different types of evidence is lacking in this health domain. Specifically, research is needed comparing both the cognitive and affective reactions to these messages as well as the relative effectiveness of the two types of evidence as a result of cognitive and affective reactions to them.

Statistical Evidence Messages vs. Narratives. Baesler and Burgoon (1994) noted that "an issue unresolved in the persuasion and argumentation literature is the type of evidence that is most likely to bolster beliefs in a claim: statistical evidence or report evidence of a story or case variety" (p. 582). There is mixed support for which type of evidence is more persuasive. Previous research on the persuasiveness of statistical evidence versus case-history (or narrative) messages predominantly has found that narrative messages are significantly more memorable and persuasive (Harte, 1976; Koballa, 1986; Nisbett & Ross, 1980; Sherer & Rogers, 1984; Taylor & Thompson, 1982). Indeed, in his comprehensive review of the literature on evidence, Reinard (1988) stated that "a body of research has shown that—all other things being equal—anecdotal reports may have more persuasive impact than statistics" (p. 24). However, a recent meta-analysis by

Allen and Preiss (1997) indicated that statistical evidence messages are more persuasive than narrative evidence. Similarly, other studies also found either that statistical evidence is more persuasive than stories (Baesler & Burgoon, 1994; Dickson, 1982; Kazoleas, 1993; Wells & Harvey, 1977) or that there is no difference in the persuasiveness of the different evidence types (Iyengar & Kinder, 1987; Nadler, 1983; Reyna, Woodruff, & Brainerd, 1987). Thus, evidence can be found to suggest that both statistical evidence messages and narratives can be effective persuasive appeals, but two important questions remain unanswered: *Why* are these different evidence types persuasive? *What* reactions do they typically engender?

Several theories have been advanced to account for the varied findings. The vividness effect (Nisbett & Ross, 1980) suggests that vivid messages such as narratives are more memorable and persuasive than are pallid messages. The causal relevance argument (Taylor & Thompson, 1982) proposes that case histories, or narratives, are superior in aiding message recipients in the discernment of the causal relevance of information to the judgements they make. Baesler and Burgoon (1994) propose that sample size may "operate as a heuristic favoring the persuasiveness of statistics because a claim based on a large sample [statistics] should have more of an impact than an identical claim based on a small sample [stories]" (p. 584). Again, evidence can be found to suggest the superiority of each explanation, but it still is not clear what types of reactions statistical evidence messages and narratives generate when used as persuasive tools.

Most of the research just discussed suggests that there is a cognitive component involved in persuasion, but Kaplan (1991) proposes that affect may also have an influence on this process since social judgment is a joint product of both cognition and affect. Dillard and Kinney (1994) also contend that cognition is related to certain forms of emotional response. Examining both the cognitive and the affective reactions to different types of persuasive organ donation messages may allow for some insight into the aspects that make statistical evidence and narrative messages persuasive to the two key segments of the population: those willing to become organ donors who have not signed donor cards, and those unwilling to become donors.

Many other studies have attempted to prove that one type of evidence is more persuasive than the other or that one theory is most valid. The present research takes a different approach in order to understand the *cognitive* and *affective* effects of both statistical evidence messages and narratives. Gaining knowledge about these reactions to the different evidence types will allow for the development of more effective persuasive communications specifically designed for each particular audience.

Cognitive Reactions

Research has demonstrated that many different cognitive processes may be occurring when an individual reads a persuasive message. Three types of reactions to organ donation messages will be considered here: thoughts generated as a result of the message, ratings about the credibility and effectiveness of the message, and the assessment of causal relevance created by the message.

Thoughts. The Heuristic Systematic Model (HSM) (Chaiken, Liberman, & Eagly, 1989) postulates two paths leading to persuasion: a *systematic route* in which careful consideration is given to a persuasive message, and a *heuristic route* in which persuasion results from simple decision rules about factors other than the specific message content. The HSM suggests that when persuasion occurs via the systematic path, individuals are scrutinizing the arguments presented in a persuasive message and are thinking about this information in relation to other information they may possess about that particular topic. This process of cognitive elaboration of the persuasive message typically results in the integration of the new arguments into an individual's underlying belief structure about the topic at hand.

When the systematic route to persuasion is employed, some amount of cognitive elaboration, or thought about issue-relevant arguments, occurs. This process implies not only that the message arguments themselves are considered but also that additional relevant thoughts or ideas about the topic are entertained by the reader. If considered through the systematic route, both statistical evidence and narrative messages should generate a number of additional thoughts about the topic, but systematic processing may be enhanced or inhibited by the quality and type of the arguments. Evidence of this was shown in related research by Hale, Mongeau, and Thomas (1991) as they found that the number of cognitions generated by respondents was greater for refutational two-sided messages than for either nonrefutational two-sided messages or one-sided messages. Similarly, research has shown that strong messages, such as statistical evidence messages presenting reliable statistical and factual information, produce greater elaboration than weak messages, such as narratives presenting information from one person's point of view. Thus, readers considering statistical evidence messages should be expected to generate a greater number of issue-relevant thoughts than readers considering narrative messages. Since these individuals are attempting to assess the merits of the message, it is likely that both thoughts in support of the message arguments and thoughts against the message arguments may be considered. Therefore, not only should the total number of number of thoughts generated be higher for those reading statistical evidence messages than for those reading narratives, but these messages also should produce a greater number of both positive thoughts (those supporting the message) and negative thoughts (those against the message) about the issue. Given these considerations, Hypothesis 1 is offered.

H1: Respondents reading statistical evidence messages will produce a higher number of total, positive, and negative thoughts about organ donation than will respondents who read narratives.

Message Ratings. The HSM (Chaiken, Liberman, & Eagly, 1989) also postulates that persuadees may process a message by using heuristic cues in addition to assessing issue-relevant arguments. When comparing types of evidence, Baesler and Burgoon (1994) assert that claims based on aggregated reports, such as statistical evidence messages stating facts and statistics, should be more believable than claims based on a single report, like a case history or a narrative. Following Kahneman and Tversky's (1973) argument regarding heuristics, Baesler and Burgoon suggest that sample size may operate as a heuristic such that the large

sample size of statistics is seen as more persuasive and believable than a sample size of one individual's story. If this is the case, then we would expect that statistical evidence messages should be perceived as more credible and effective than narrative messages. In other words, on a series of scales designed to assess perceptions of a message's credibility, appropriateness, reliability, knowledgeable ability, thoroughness, and effectiveness, statistical evidence messages should generate higher ratings than narrative messages, and Hypothesis 2 may be offered.

H2: Statistical evidence messages will generate higher ratings of message credibility and effectiveness than will narratives.

Causal Relevance. While arguments such as sample size suggest that statistical evidence messages should be more persuasive, other explanations advance cognitive processes that favor the persuasiveness of narratives. Kazooleas¹ (1993), for example, notes that narratives may be more effective than statistics because they are more vivid, they elicit more attention and interest, and they generate more concrete images in readers' minds. He suggests that individuals may have difficulty making causal inferences from statistical information because they are unable to utilize information presented in this format. This idea is consistent with Taylor and Thompson's (1982) claim that "subjects can readily discern the causal relevance of case history information to the to-be-made judgments but are less able to see that causal relevance when information is presented statistically" (p. 163). They suggest that personal relevance generally increases attention to the information being presented which leads to increased persuasion, such that if the reader perceives him/herself to be *similar* to the character portrayed in the narrative he/she will pay more attention to the purpose of the message, (thereby increasing the likelihood that he/she will engage in systematic processing) and thus be persuaded.

Another possibility is that if the reader perceives that he/she can help solve the problem being presented, attention again will be focused on the content of the message, systematic processing will occur, and persuasion will increase. This idea is consistent with a concept, termed self-efficacy, discussed in the fear appeal literature (Witte, 1992). Individuals are said to have high self-efficacy when they believe they have the ability to solve a problem by performing the recommended action. With statistical evidence messages, information about the problem is provided to the reader and a logical solution is presented, but there is a cognitive gap between the problem and the solution because the lack of causal relevance provides no cognitive link between the two. In other words, this cognitive gap prevents readers from perceiving high self-efficacy regarding the topic. With narrative messages, both the problem and a possible solution typically are presented such that the reader can see how the character is able to help solve the problem. Thus there is no cognitive gap perceived between problem and solution, and high self-efficacy is experienced. If the reader perceives him/herself to be similar to the character in the story, causal relevance is increased and he/she is able to forge a cognitive link between the problem and his/her part in the solution (resulting in high self-efficacy). Given these considerations, we offer Hypothesis 3.

H3: Respondents reading narratives will report a greater sense of causal relevance in terms of problem solving and similarity than will respondents reading statistical evidence messages.

Affective Reactions

As with cognitive reactions, many different affective reactions may be produced when reading persuasive messages. Two types of affective reactions will be employed in the present research: general emotions generated as a result of the message and more specific feelings of anxiety produced by the message.

Emotions. "It is generally accepted that stories are more concrete, more imagery provoking, and more colorful than statistics that are often abstract, dry, and pallid" (Baesler & Burgoon, 1994). This notion has led several scholars to suggest what has been called the vividness effect, which as was mentioned briefly earlier, proposes that vivid information serves as a heuristic cue in that it is more persuasive than nonvivid information (e.g., Nisbett & Ross, 1980; Taylor & Thompson, 1982). One of the many reasons advanced for this explanation states that vivid material is presumed to be more emotionally interesting than nonvivid information (Taylor & Thompson, 1982), and vivid messages have been shown to arouse or induce specific emotions whereas nonvivid messages have not. Thus, vivid messages such as narratives should be expected to produce more emotional responses than nonvivid messages such as statistical evidence messages. When asked to list these emotional responses, individuals reading narratives should generate a greater number of emotions than those reading statistical evidence messages, as proposed in Hypothesis 4.

H4: Respondents reading narratives will generate a greater number of total, positive, and negative emotions than will respondents who read statistical evidence messages.

Anxiety. In previous work on organ donation, Smith and her colleagues (Smith et al. 1993, 1994) have demonstrated that fear is commonly associated with this topic. Individuals thinking about organ donation may entertain such fears as body mutilation, expenses accruing to the donor's survivors, and donor card holders receiving less medical attention in critical situations. Although these concerns have no factual basis, they still tend to create anxiety for many people. As fear tends to be emotional in nature, it is possible that vivid messages such as narratives may capture the imagination of the reader, increasing the sense of anxiety created by these fears, while nonvivid messages such as statistical evidence messages would not have such an effect. Thus, we would expect that narratives should create a greater level of anxiety than statistical evidence messages.

H5: Narratives will produce a higher level of anxiety in respondents than will statistical evidence messages.

Prior Thought and Intent

As previously indicated, an additional independent variable must be taken into account when examining the issue of organ donation. Research in this area has found that level of prior thought and intent demonstrated a strong influence on both cognitive and affective outcomes after individuals read a persuasive message about organ donation (Smith et al., 1993, 1994). Specifically, prior thought and intent biased the cognitive processing of persuasive messages such that individu-

als high in prior thought and intent evidenced significantly higher positive belief change and behavior change than did persons low in prior thought and intent. Also, low prior thought and intent individuals perceived these same messages to be significantly more fear and anxiety-producing than those high in prior thought and intent. Given that this variable has created such an important impact on dependent measures in past research, we would expect this pattern to continue in the present research such that individuals low in prior thought and intent will react differently across all dependent variables than those high in prior thought and intent. Specifically, we predict that:

- H6:** Regardless of evidence type, prior thought and intent (PTI) will produce different effects across all of the dependent variables such that:
- A:** Individuals with low PTI will demonstrate a higher number of negative thoughts and a higher number of negative emotions than will those with high PTI.
 - B:** Individuals with high PTI will demonstrate a higher number of positive thoughts and a higher number of positive emotions than will those with low PTI.
 - C:** Individuals with low PTI will rate messages lower in credibility and effectiveness than will individuals with high PTI.
 - D:** Individuals with low PTI will report lower levels of causal relevance than will those with high PTI.
 - E:** Individuals with low PTI will demonstrate greater anxiety than will those with high PTI.

Method

Participants

Respondents were ninety undergraduate students enrolled in communication courses at a large midwestern university who earned extra credit for their participation. Young adults are a desired target population for this study because they generally are in good health and live somewhat dangerous lives. Also, if they sign donor cards at this age, they are likely to continue to carry them throughout their lifetimes.

Stimulus Materials

Overview. To examine these six hypotheses, a repeated measures design with a within-subjects factor (evidence type) and a between-subjects factor (prior thought and intent) was employed. Respondents were asked to rate their prior thought and intent about organ donation and then were presented with two of four persuasive messages regarding organ donation. Each respondent read one statistical evidence message and completed measures assessing all of the dependent variables for that message, and then read one narrative and completed the same measures for the second message.

Prior Thought and Intent. Respondents first were asked to rate their prior thought and intent concerning organ donation on six 7-point Likert-type scales from "Strongly Agree" (1) to "Strongly Disagree" (7).² This measure ($\alpha = .95$) was demonstrated to be unidimensional according to confirmatory factor analysis procedures ($\chi^2 = 18.14$, $p = .13$). Prior to analysis, the average rating on these

items for each participant was used to break the sample into two groups. Those who had a mean score of two or less were placed in the high prior thought and intent group, while those who had a mean score greater than two were placed in the low prior thought and intent group.

Messages. Each respondent was presented with two messages regarding organ donation—one statistical evidence message and one story. Both types of messages contained the same major premise urging readers to become potential organ donors by signing donor cards, however these messages differed in terms of the evidence offered to support this major premise. The statistical evidence messages used were two adaptations of Smith, Morrison, Kopfman, and Ford's (1994) factual messages urging commitment to organ donation, and changes included updated statistics and the elimination of a few factual statements. The two narratives used were fictitious scenarios created by the authors after reading many cases of actual organ donors and recipients. Both narratives portrayed a college student who died suddenly and became an organ donor, and information about the individuals saved by this donation was provided. The end of both narratives emphasized that the decision to sign an organ donor card was the reason that others' lives could be saved (See Appendix A for all messages).

Causal Relevance. After reading each message, respondents were asked to complete six items assessing the causal relevance of the message on 7-point Likert-type scales from "Strongly Agree" (1) to "Strongly Disagree" (7). Exploratory factor analysis procedures indicated that this measure yielded two distinct factors. The first factor, which was labeled "problem solving"³ ($\alpha = .88$), contained four items demonstrating that participants feel that donating their organs would help solve the organ shortage. The problem solving factor was shown to be unidimensional using confirmatory factor analysis procedures ($\chi^2 = 4.44$, $p = .22$). The second factor, labeled "similarity"⁴ ($\alpha = .88$) contained two items indicating that participants believed they were similar to the individuals portrayed in the message. These two factors were used as separate indicators of causal relevance in the data analysis.

Anxiety. Anxiety was assessed using a four-item measure⁵ developed by the authors ($\alpha = .83$) which was shown to be unidimensional when subjected to confirmatory factor analysis procedures ($\chi^2 = .13$, $p = 1.0$). Participants were asked to respond to statements on 7-point Likert-type scales from "Strongly Agree" (7) to "Strongly Disagree" (1).

Ratings. Next, respondents were asked to complete six 7-point Likert-type items assessing the credibility and effectiveness of the message.⁶ This scale was unidimensional according to confirmatory factor analysis procedures ($\chi^2 = 21.60$, $p = .08$), and the reliability of these items was quite high ($\alpha = .95$).

Thoughts and Emotions. After indicating their ratings of the message, respondents were asked to complete an open-ended measure which requested any thought and feelings (positive, negative, or neutral) that were experienced while reading the message to be written in the respondents' own words. Responses to this measure were coded separately by two of the authors to determine whether

each statement provided by the respondents was a thought or an emotion. Following a scheme recommended by Shapiro (1994), statements favoring the message position were coded as positive thoughts, those against or countering the message position were coded as negative thoughts, and those which neither favor nor oppose the message position were coded as neutral thoughts. The number of positive, negative and neutral thoughts were summed to obtain the number of total thoughts listed for each respondent. Statements which reflected a pleasant emotion such as happiness or comfort were coded as positive emotions while those which reflected a negative emotion such as sadness or fear were coded as negative emotions. These were then summed for each respondent to obtain the total number of emotions listed. Since emotions are necessarily valenced, no neutral category was employed for coding emotions. Intercoder reliability was quite high (Cohen's Kappa = .87), and all discrepancies were resolved through discussion. Each respondent's frequency counts for all categories were used in the data analysis, as were the total number of thoughts (positive, negative, and neutral) and the total number of emotions (positive and negative) listed by each respondent.

Results

Prior to analysis, statistical procedures examining the four different messages were performed. T-tests indicated that there were no significant differences between the two statistical evidence messages on any dependent variable and no significant differences between the two narratives on any dependent variable. Thus, the two forms of each evidence type could be combined, providing two instantiations of each evidence type. Subsequent analyses then could be performed examining the two levels of evidence type: statistical evidence and story.

All hypotheses then were examined by means of a series of 2×2 (Evidence type \times Level of prior thought and intent) repeated measures analyses of variance (ANOVAs). The results of these tests for all dependent variables are reported below, and the means, standard deviations, and size of each cell for all dependent variables are presented in Table 1. No interaction effects were found to be significant in these analyses. Main effects for evidence type will be discussed first, followed by the main effects for prior thought and intent.

Hypothesis 1

Hypothesis 1 predicted that respondents reading statistical evidence messages would produce a significantly higher number of total, positive, and negative thoughts about organ donation than would respondents reading narratives. The ANOVA on total thoughts revealed a significant main effect for evidence type ($F(1, 86) = 3.91, \eta^2 = .04, p < .05$). After a statistical evidence message, respondents produced a significantly higher total number of thoughts ($M = 1.99$) than after reading a story ($M = 1.65$).

Examination of each type of thought (positive, negative, and neutral) revealed similar patterns. The ANOVA on positive thoughts indicated a main effect approaching significance for evidence type ($F(1, 86) = 2.5, \eta^2 = .03, p = .12$) such that respondents reading the statistical evidence messages generated a higher number of positive thoughts ($M = 1.27$) than they did when reading the narratives

TABLE 1
Mean Scores Cognitive and Affective Outcomes by Evidence Type and Prior Thought/Intent

(PTI = prior thought and intent)	Statistical Evidence			Narrative			Row Mean
	M	SD	n	M	SD	n	
<i>Total thoughts</i>							
High PTI	1.73	1.32	45	1.47	1.22	45	1.60
Low PTI	2.26	1.71	43	1.84	1.27	43	2.05
Column mean	1.99	1.54	88	1.65	1.25	88	
<i>Positive thoughts</i>							
High PTI	1.13	1.04	45	1.04	1.04	45	1.09
Low PTI	1.42	1.45	43	1.00	1.09	43	1.21
Column mean	1.27	1.26	88	1.02	1.06	88	
<i>Negative thoughts</i>							
High PTI	.49	.87	45	.27	.58	45	.22
Low PTI	.65	.78	43	.72	.98	43	.66
Column mean	.57	.83	88	.49	.83	88	
<i>Neutral thoughts</i>							
High PTI	.11	.44	45	.16	.42	45	.13
Low PTI	.19	.50	43	.12	.39	43	.15
Column mean	.15	.47	88	.14	.41	88	
<i>Message ratings</i>							
High PTI	2.29	1.06	45	2.34	1.26	45	2.31
Low PTI	2.62	1.11	42	3.14	1.51	42	2.88
Column mean	2.45	1.09	87	2.73	1.44	87	
<i>Problem solving</i>							
High PTI	1.76	.76	44	1.76	.83	44	1.76
Low PTI	2.27	.98	42	2.66	1.15	42	2.46
Column mean	2.01	.90	86	2.20	1.09	86	
<i>Similarity</i>							
High PTI	2.08	1.08	45	2.71	1.56	45	2.39
Low PTI	3.09	1.09	43	3.85	1.43	43	3.47
Column mean	2.57	1.19	88	3.27	1.59	88	
<i>Total emotions</i>							
High PTI	.47	.73	45	.58	.89	45	.52
Low PTI	.88	1.01	43	1.16	1.45	43	1.02
Column mean	.67	.89	88	.86	1.22	88	
<i>Positive emotions</i>							
High PTI	.24	.48	45	.36	.71	45	.30
Low PTI	.26	.49	43	.47	.74	43	.36
Column mean	.25	.49	88	.41	.72	88	
<i>Negative emotions</i>							
High PTI	.22	.56	45	.22	.42	45	.22
Low PTI	.63	.90	43	.70	1.06	43	.66
Column mean	.42	.77	88	.46	.83	88	
<i>Anxiety</i>							
High PTI	2.48	1.09	45	2.58	1.31	45	2.53
Low PTI	3.15	1.38	43	3.60	1.37	43	3.37
Column mean	2.81	1.27	88	3.08	1.43	88	

($M = 1.02$). Similarly, the number of negative thoughts produced after reading statistical evidence messages was higher ($M = .57$) than for the narratives ($M = .49$), and the number of neutral thoughts was higher for statistical evidence messages ($M = .15$) than for narratives ($M = .14$), although neither of these main effects were significant. Thus, given that respondents offered a higher number of positive, negative and neutral thoughts after reading a statistical evidence message, and given that there was a significant main effect for evidence type when examining total thoughts, some support is offered for Hypothesis 1. Statistical evidence

messages did produce a higher number of thoughts about organ donation than narratives.

Hypothesis 2

Hypothesis 2 predicted that statistical evidence messages would generate higher ratings of message credibility and effectiveness than would narratives. The ANOVA on ratings indicated that there was a significant main effect for evidence type ($F(1, 85) = 3.88$, $\eta^2 = .04$, $p < .05$) such that the statistical evidence messages received higher ratings of appropriateness, effectiveness, reliability, knowledgeability, credibility, and thoroughness ($M = 2.45$, where 1 is the most favorable rating and 7 is the least favorable) than the story messages ($M = 2.73$). Thus, the data are consistent with Hypothesis 2.

Hypothesis 3

Hypothesis 3 proposed that respondents reading narratives would report a significantly greater sense of causal relevance than respondents reading statistical evidence messages. To assess this hypothesis, both portions of the causal relevance variable, problem solving and similarity, were examined. The ANOVA on the problem solving factor indicated a main effect for evidence type approaching significance ($F(1, 84) = 3.44$, $\eta^2 = .04$, $p < .07$), however the means illustrated that this effect is opposite that predicted in Hypothesis 3. Respondents were more likely to feel that they could help reduce the organ shortage by signing an organ donor card when they read the statistical evidence messages ($M = 2.01$, where 1 indicates greater problem solving and 7 indicates little problem solving) than after reading the narratives ($M = 2.20$). Examination of the ANOVA on the similarity factor revealed an identical pattern. A significant main effect ($F(1, 86) = 17.47$, $\eta^2 = .17$, $p < .01$) was found, but this effect is opposite of that predicted in the hypothesis. Respondents were more likely to feel similar to the individuals in the statistical evidence message ($M = 2.57$) than to individuals in the narratives ($M = 3.27$). The combination of these results indicate that Hypothesis 3 must be rejected. Narratives did not generate a higher sense of causal relevance, but rather, high causal relevance was demonstrated after respondents read the statistical evidence messages.

Hypothesis 4

Hypothesis 4 suggested that respondents reading narratives would generate a significantly higher number of total, positive, and negative emotions than those reading statistical evidence messages. The ANOVA on total emotions indicated that although respondents did produce a higher number of emotions after reading a story ($M = .86$) than when reading a statistical evidence message ($M = .67$), this main effect for evidence type was not statistically significant. A similar pattern was observed when the ANOVAs for positive and negative emotions were examined separately. A higher number of positive emotions were recorded by respondents after reading a story ($M = .41$) than after a statistical evidence message ($M = .25$), but this main effect only approached significance ($F(1, 86) = 2.96$, $\eta^2 = .03$, $p < .09$). The ANOVA on negative emotions revealed no significant main effect for evidence type, but respondents did produce a somewhat

higher number of negative emotions for narratives ($M = .46$) than for statistical evidence messages ($M = .42$). Thus, no statistical support is offered for Hypothesis 4, but it need not be hastily rejected as trends for positive, negative and total emotions were in the predicted direction.

Hypothesis 5

Hypothesis 5 predicted that narratives would produce a significantly higher level of anxiety in respondents than statistical evidence messages. The ANOVA on anxiety indicated a main effect for evidence type ($F(1, 86) = 4.57, \eta^2 = .05, p < .04$) such that anxiety was greater for respondents after reading a story ($M = 3.08$) than after reading a statistical evidence message ($M = 2.81$). These results suggest that narratives are rated as more anxiety-producing than statistical evidence messages as the data are consistent with Hypothesis 5.

Hypothesis 6

Hypothesis 6 proposed that, regardless of evidence type, prior thought and intent would produce differing effects across all of the dependent variables such that individuals with low prior thought and intent would demonstrate higher numbers of negative thoughts and negative emotions, lower message ratings, a decreased sense of causal relevance, and greater anxiety than those with high prior thought and intent; and that individuals with high prior thought and intent would demonstrate higher numbers of positive thoughts and positive emotions, higher message ratings, an increased sense of causal relevance, and less anxiety than those with low prior thought and intent. Examination of the ANOVAs on each of the dependent variables should provide insight into each of these predicted relationships.

As shown in Table 2, the ANOVA on negative thoughts indicated a significant main effect ($F(1, 86) = 5.51, \eta^2 = .06, p < .02$) for prior thought and intent (PTI). For both narratives and statistical evidence messages, respondents with low PTI generated significantly more negative thoughts ($M = .66$) on the open-ended measure than did the respondents high in PTI ($M = .22$). Similarly, the ANOVA on negative emotions revealed a significant main effect for PTI ($F(1, 86) = 11.60, \eta^2 = .12, p < .01$) such that individuals low in PTI recorded a significantly higher number of negative emotions ($M = .66$) when reading both the story and the statistical evidence message than did the individuals high in PTI when reading the same messages ($M = .22$). These results indicate that low prior thought and intent respondents did demonstrate significantly higher numbers of negative thoughts and negative emotions than respondents high in prior thought and intent, which is consistent with the prediction made in Hypothesis 6A.

While individuals low in prior thought and intent were expected to generate more negative thoughts and emotions, those high in prior thought and intent were predicted to generate more positive thoughts and emotions. As the ANOVAs on positive thoughts ($F(1, 86) = .40, \eta^2 = .00, p = .53$) and positive emotions ($F(1, 86) = .42, \eta^2 = .00, p = .52$) indicated, no significant effect was found for prior thought and intent on either of these dependent variables. Although the means suggest that respondents low in PTI generated a higher number positive emotions ($M = .36$) than those high in PTI ($M = .30$), no such pattern can be identified when examining the means for positive thoughts. These results indicated that respon-

dents high in prior thought and intent did not generate a significantly higher number of positive thoughts and emotions than those low in prior thought and intent. Therefore, no support is offered for Hypothesis 6B.

Ratings of message credibility and effectiveness were suggested to be lower for individuals low in prior thought and intent but higher for those high in prior thought and intent, and the ANOVA on ratings indicated that this main effect indeed was significant ($F(1, 85) = 6.48, \eta^2 = .07, p < .01$). Respondents in the low PTI group rated both evidence types significantly lower ($M = 2.88$, where 1 is a high rating and 7 is a low rating) than those high in PTI ($M = 2.31$). Thus, consistent with Hypothesis 6C, analysis of the message ratings revealed a statistically significant pattern in the predicted direction for both groups of prior thought and intent.

Causal relevance was hypothesized to increase for the high prior thought and intent respondents and decrease for the low prior thought and intent respondents. Both factors of this variable must be examined to assess this prediction. The ANOVA on the problem solving factor indicated a significant main effect ($F(1, 84) = 16.31, \eta^2 = .16, p < .01$) for prior thought and intent such that problem solving was significantly higher for individuals high in PTI ($M = 1.76$ where 1 indicates high levels of causal relevance and 7 indicates low levels of causal relevance) than for those low in PTI ($M = 2.46$). In like fashion, a main effect for the similarity factor also was observed ($F(1, 86) = 23.29, \eta^2 = .21, p < .01$) such that similarity was perceived to be significantly higher for the high PTI group ($M = 2.39$) than for the low PTI group ($M = 3.47$). The combination of these results indicate support for Hypothesis 6D such that respondents low in prior thought and intent did demonstrate a decreased sense of causal relevance and that those high in prior thought and intent did demonstrate an increased sense of causal relevance.

Anxiety was proposed to be greater for those respondents in the low prior thought and intent group and to be less for those in the high prior thought and intent group, and the ANOVA on anxiety revealed this main effect to be significant ($F(1, 86) = 31.14, \eta^2 = .12, p < .01$). Low PTI respondents demonstrated significantly higher levels of anxiety ($M = 3.37$) than the high PTI respondents ($M = 2.53$). Thus, anxiety was found to be greater for respondents low in prior thought and intent and less for those high in prior thought and intent. These results are consistent with the prediction made in Hypothesis 6E.

Overall, these results indicate significant, but not complete, support for Hypothesis 6. Prior thought and intent did produce differing effects across all five of the dependent variables (thoughts, emotions, causal relevance, ratings, and anxiety), and the results suggest that the data are consistent with all of the predictions for individuals with low prior thought and intent. Data are also consistent with the predictions for individuals with high prior thought and intent on the ratings, causal relevance, and anxiety variables. However, no significant findings lend support to the predictions that individuals high in prior thought and intent should generate higher numbers of positive thoughts and positive emotions (Hypothesis 6B).

Discussion

This investigation was undertaken in order to examine affective and cognitive reactions to narrative versus statistical evidence organ donation strategies. The influence of prior thought and intent on these reactions also was explored. In

combination, the results of this research allow for insight into the reasons that both narrative and statistical evidence messages can be effective persuasive tools in health related venues. More specifically, these results provide some understanding of the type of evidence that is likely to be persuasive to different groups of individuals based on their level of prior thought and intent about organ donation.

Examined as a whole, an interesting picture of prior thought and intent, evidence type, and cognitive and affective reactions emerges. While data indicate that evidence type and prior thought and intent do not interact to produce significant differences in cognitive and affective reactions, there is a significant independent effect for each of these variables. Generally, statistical evidence messages produced greater results on all of the cognitive dependent variables while narratives produced greater results on all of the affective variables, and level of prior thought and intent influenced both cognitive and affective reactions to the messages.

Specifically, statistical evidence organ donation messages had a greater influence on the respondents' cognitive reactions such that a higher number of total thoughts about organ donation were produced and higher message ratings were given when subjects read the statistical evidence messages than when they read narratives. Similarly, a greater sense of causal relevance was perceived by subjects when reading the statistical evidence messages, although this finding was contrary to our prediction.

Narratives about organ donation demonstrated a greater influence on the respondents' affective reactions as narratives were rated by the respondents as significantly more anxiety-producing than statistical evidence messages. Narratives also compelled individuals to generate more total, positive, and negative emotions than statistical evidence messages, although this effect was not found to be statistically significant.

Prior thought and intent evidenced a significant influence on all of the dependent variables. No matter which type of evidence they read, individuals with low prior thought and intent rated the persuasive messages as lower in credibility and effectiveness. These same individuals felt a decreased sense of causal relevance in that they did not perceive themselves as similar to the people depicted in the messages and they did not feel that they could help solve the organ shortage. These low prior thought and intent respondents also felt greater anxiety when reading the messages, and they generated a higher number of negative thoughts and emotions after reading the messages.

Individuals high in prior thought and intent demonstrated a different pattern of reactions. They rated both types of messages higher in credibility and effectiveness, and they reported feeling little anxiety when reading messages about organ donation. They felt a greater sense of causal relevance in that they perceived themselves as similar to the people in the messages and they felt that they could contribute to reducing the organ shortage by becoming an organ donor, however, they did not produce more positive thoughts and emotions in response to the messages.

Theoretical Implications

While evidence suggests that both statistical evidence messages and narratives can be persuasive in general and in the domain of organ donation research,

previous research has not examined why both of the types of evidence can be persuasive or the reactions they typically engender. Our goal was to gain insight into the cognitive and affective reactions to statistical evidence and narrative persuasive messages about organ donation in order to determine why these different types of evidence are persuasive.

Our findings can be interpreted in terms of the HSM (Chaiken, Liberman, & Eagly, 1989). Statistical evidence messages produced significantly higher rates of systematic processing in terms of total thoughts, positive thoughts, and perceived causal relevance than did narratives. Statistical evidence messages also produced significantly higher ratings of cognitive heuristic cues, such as credibility and effectiveness, than did narratives. Thus, in terms of the HSM, statistical evidence messages produced both higher systematic and heuristic cognitive processing than did narratives. By contrast, narratives produced a higher number of affective reactions and significantly different ratings of anxiety than did statistical evidence messages. These affective ratings can also serve as heuristic cues. For example, the thought "If I feel anxious as a result of reading this message, I must be against organ donation" could serve as a heuristic cue as could a positive emotional reaction. Narratives, then, produced stronger affective reactions that can serve as heuristic cues than did statistical evidence messages, but no indication of systematic processing can be found for narratives. In terms of the HSM, the patterns of reactions found here would lend credence to the superiority of statistical evidence messages as persuasive tools because statistical evidence messages showed higher systematic *and* heuristic processing.

Previous findings with regard to the persuasiveness of statistical evidence messages can be explained through this framework as well. For example, Baesler and Burgoon (1994) found that "vivid and nonvivid statistical evidence were persuasive relative to the control at 48 hours, and vivid statistical evidence remained persuasive through 1 week. Neither form of story evidence was persuasive relative to the control at delayed time intervals" (p. 582). Emotional reactions tend to be more ephemeral and fleeting (Forgas, 1991), and presumably, the emotions evoked by the narrative messages decayed after two days. If belief change was assessed immediately following the persuasive message, then narratives might be expected to demonstrate greater persuasive effects, but the effects of systematic and heuristic processing should be more long-lasting. Thus, statistical evidence messages should be more persuasive over time than narratives, and this is exactly the pattern of results they found.

Practical Applications and Directions for Future Research

Our findings indicate that researchers who are interested in the differential effects of narrative and statistical evidence persuasive messages must determine the cognitive and affective reactions that occur between the presentation of the persuasive message and the measurement of the persuasion outcomes. This suggestion is particularly important when examining the effectiveness of persuasive messages in the health domain as cognitive reactions usually are the target of the messages yet affective reactions are inevitable given the personally relevant topic. Health communication researchers need to be aware of both the cognitive and affective reactions they engender when distributing their messages. As the present study demonstrated, when the desired health behavior is distant in time

from the receipt of the message (as most are), statistical evidence should be used to support claims, because this type of evidence has been shown to generate more thoughts, greater causal relevance, and greater use of heuristic cues such as credibility and effectiveness than narrative evidence does. Processing variable such as these have been shown to lead to higher persuasiveness (Allen & Preiss, 1997; Baesler & Burgoon, 1994) at delayed time intervals, which should lead to the performance of the desired health behavior.

Based on our research, health practitioners also may want to think about the issue of prior thought and intent for their population. Persons low in prior thought and intent to perform a desired health behavior might be more likely to have negative thoughts and emotions in response to health messages, keeping them from responding in the desired manner. Meanwhile, persons high in prior thought and intent should be more likely to feel less anxious, to see the health messages as effective and credible, and to feel that they can do something about the problem. Messages targeted to a high PTI audience should be most effective.

Now that we have some insight into the cognitive and affective reactions to organ donation messages, our findings suggest that the next step in the program of research described here is to determine actual persuasive outcomes of statistical evidence versus narrative messages presented to those differing in prior thought and intent to sign an organ donor card. In addition to determining the effectiveness of these distinct evidence types, future research also needs to examine whether a combination of statistical and narrative evidence might be effective. Allen and Preiss (1997) also suggest that combining these two methods of proof into one message may prove to be most persuasive, but this issue has yet to be addressed in the extant literature.

Endnotes

1. It should be noted that Kazoleas presents this hypothesis in his literature review as a potential explanation for the superiority of narratives, but later rejects this same argument due to evidence from the data collected in his study.

2. Items on the Prior Thought and Intent scale included: I intend to or I have previously signed an organ donor card; I have considered the possibility of becoming an organ donor; I have been meaning to sign or I have already signed an organ donor card; I have thought about signing or I have signed an organ donor card; I do not intend to sign an organ donor card (reflected); At some time in the future, I plan to sign an organ donor card, or I have previously signed one.

3. Items on the Problem Solving scale included: The message is realistic; After reading the message I see that donating my organs will help to save others' lives; The message is believable; After reading the message I can see that by becoming an organ donor I can help reduce the organ donor shortage.

4. Items on the Similarity scale included: I can identify with the message; I can relate to the message.

5. Items on the Anxiety scale included: I felt threatened when I read this message; I felt afraid when I read this message; I felt apprehensive when I read this message; I felt reassured when I read this message (reflected).

6. Items on the Ratings scale included: I felt the message was appropriate; I felt the message was effective; I felt the message was reliable; I felt the message was knowledgeable; I felt the message was credible; I felt the message was thorough.

References

- Allen, M., Hale, J., Mongeau, P., Berkowitz-Stafford, S., Stafford, S., Shanahan, W., Agee, P., Dillon, K., Jackson, R., & Ray, C. (1990). Testing a model of message sidedness: Three replications. *Communication Monographs, 57*, 275–291.

- Allen, M., & Preiss, R. W. (1997). Comparing the persuasiveness of narrative and statistical evidence using meta-analysis. *Communication Research Reports*, 14, 125-131.
- Baessler, E. J., & Burgoon, J. K. (1994). The temporal effects of story and statistical evidence on belief change. *Communication Research*, 21, 582-602.
- Bennett, W. L. (1978). Storytelling in criminal trials: A model of social judgment. *Quarterly Journal of Speech*, 64, 1-22.
- Boster, F. J., & Mongeau, P. (1984). Fear-arousing persuasive messages. In R. Bostrom (Ed.), *Communication yearbook 8* (pp. 330-375). Newbury Park, CA: Sage.
- Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Burgoon, M. (1995). Language expectancy theory: Elaboration, explication, and extension. In C. R. Berger & M. Burgoon (Eds.), *Communication and social influence processes* (pp. 29-52). East Lansing, MI: Michigan State University Press.
- Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212-252). New York: Guilford Press.
- Cox, J. (1986). Organ donation: The challenge for emergency nursing. *Journal of Emergency Nursing*, 12, 199-204.
- Dickson, P. R. (1982). The impact of enriching case and statistical information on consumer judgments. *Journal of Consumer Research*, 8, 398-406.
- Dillard, J. P., & Kinney, T. A. (1994). Experiential and physiological responses to interpersonal influence. *Human Communication Research*, 20, 502-528.
- Ford, L. A., & Smith, S. W. (1991). Memorability and persuasiveness of organ donation message strategies. *American Behavioral Scientist*, 34, 695-711.
- Forgas, J. P. (1991). Affect and social judgments: An introductory review. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 3-29). New York: Pergamon Press.
- The Gallup Organization. (1987, April). *The U.S. public's attitudes toward organ transplants/donation: 1987* (Survey conducted for the Dow Chemical Co., Inc.). Princeton, NJ: Author.
- Hale, J. L., Mongeau, P. A., & Thomas, R. M. (1991). Cognitive processing of one- and two-sided persuasive messages. *Western Journal of Speech Communication*, 55, 380-389.
- Harris, R. J., Jasper, J. D., Shanteau, J., & Smith, S. A. (1990). Organ donation consent decisions by the next of kin: An experimental simulation approach. In J. Shanteau & R. J. Harris (Eds.), *Organ donation and transplantation: Psychological and behavioral factors* (pp. 13-24). Washington, DC: American Psychological Association.
- Harte, T. (1976). The effects of evidence in persuasive communication. *Central States Speech Journal*, 27, 42-46.
- Iyengar, S., & Kinder, D. R. (1987). *News that matters*. Chicago: University of Chicago Press.
- Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80, 237-251.
- Kaplan, M. F. (1991). The joint effects of cognition and affect on social judgment. In J. P. Forgas, (Ed.), *Emotion and social judgments* (pp. 73-82). New York: Pergamon Press.
- Kazoleas, D. C. (1993). A comparison of the persuasive effectiveness of qualitative vs. quantitative evidence: A test of explanatory hypotheses. *Communication Quarterly*, 41, 40-50.
- Koballa, T. R., Jr. (1986). Persuading teachers to reexamine the innovative elementary science programs of yesterday: The effect of anecdotal versus data-summary communications. *Journal of Research in Science Teaching*, 23, 437-449.
- Lenehan, G. P. (1986). The gift of life: Organ donation and the emergency nurse. *Journal of Emergency Nursing*, 12, 189-191.
- Linder, D., & Worchel, S. (1970). Opinion change as a result of effortfully drawing a counterattitudinal conclusion. *Journal of Experimental Social Psychology*, 6, 432-448.
- Mandler, J. M. (1984). *Stories, scripts, and scenes: Aspects of schema theory*. Hillsdale, NJ: Lawrence Erlbaum.
- Manning, A. (1995, August 9). Mantle's family sets up organ donor program. *USA Today*, 3D.
- Marshall, J. R. (1979). Motivation and decision making of the kidney donor. In D. J. Osborne, M. M. Gruneberg, & J. R. Eiser (Eds.), *Research in psychology and medicine* (Vol. 11, pp. 60-67). San Francisco: Academic Press.
- McGuire, W. J. (1969). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (2nd ed., Vol. 3, pp. 136-314). Reading, MA: Addison-Wesley.
- McLaughlin, M. L. (1984). *Conversation: How talk is organized*. Beverly Hills, CA: Sage.

- Mongeau, P. A. (in press). Another look at fear-arousing persuasive appeals. In M. Allen & R. W. Preiss (Eds.), *Persuasion: Advances through meta-analysis*. Cresskill, NJ: Hampton.
- Nadler, M. A. K. (1983). Evidence usage in persuasion. *Dissertation Abstracts International*, 44, 910A.
- Nisbett, R. & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.
- Osborne, D. J. & Gruneberg, M. M. (1979). Some psychological barriers to kidney donation. In D. J. Osborne, M. M. Gruneberg, & J. R. Eiser (Eds.), *Research in psychology and medicine* (Vol. 11, pp. 68-75). San Francisco: Academic Press.
- Reinard, J. C. (1988). The empirical study of the persuasive effects of evidence: The status after fifty years of research. *Human Communication Research*, 15, 3-59.
- Reyna, R. M., Woodruff, W. J., & Brainerd, C. J. (1987). *Attitude change in adults and adolescents: Moderation versus polarization, statistics versus case histories*. Unpublished manuscript, University of Texas, Dallas.
- Rumelhart, D. E. (1975). Notes on a schema for stories. In D. G. Bobrow & A. Collins (Eds.), *Representation and understanding: Studies in cognitive science* (pp. 211-) New York: Academic Press.
- Shapiro, M. A. (1994). Think-aloud and thought-list procedures in investigating mental processes. In A. Lang, (Ed.). *Measuring psychological responses to media messages* (pp. 1-14). Hillsdale, NJ: Erlbaum.
- Sherer, M. & Rogers, R. (1984). The role of vivid information in fear appeals and attitude change. *Journal of Research in Personality*, 18, 321-334.
- Skowronski, J. J. (1990). Increasing the number of people who agree to donate organs: Can persuasion work? In J. Shanteau & R. J. Harris (Eds.), *Organ donation and transplantation: Psychological and behavioral factors* (pp. 122-135). Washington DC: American Psychological Association.
- Smith, S. W., Kopfman, J. E., Morrison, K., & Ford, L. A. (1993, May). *The effects of message sidedness, fear, and prior thought and intent on the memorability and persuasiveness of organ donor card message strategies*. Paper presented at the annual meeting of the International Communication Association, Washington D.C.
- Smith, S. W., Morrison, K., Kopfman, J. E., & Ford, L. A. (1994). The influence of prior thought and intent on the memorability and persuasiveness of organ donation message strategies. *Health Communication*, 6(1), 1-20.
- Stark, J. L., Reiley, P., Osiecki, A., & Cook, L. (1984). Attitudes affecting organ donation in the intensive care unit. *Heart and Lung*, 13, 400-404.
- Stein, N. L., & Glenn, G. G. (1979). An analysis of story comprehension in elementary school children. In R. O. Freede (Ed.), *New directions in discourse processing* (Vol. 2, pp. 53-82). Norwood, NJ: Ablex.
- Taylor, S. E., & Thompson, S. C. (1982). Stalking the elusive "vividness" effect. *Psychological Review*, 89, 155-181.
- US DHHS, 1986. *Organ transplantation: Issues and recommendations*. Rockville, MD: Health Resources and Services Administration.
- US DHHS, 1990. *The status of organ donation and coordination services: Report to Congress for the fiscal year 1988*. Rockville, MD: Health Resources and Services Administration.
- Waiting for Life. (1993, October 31). *Lansing State Journal*, pp. 1F, 3F.
- Wells, G. L., & Harvey, J. H. (1977). Do people use consensus information in making causal attributions? *Journal of Personality and Social Psychology*, 35, 279-293.
- Winkel, F. W. (1984). Public communication on donor cards: A comparison of persuasive styles. *Social Science and Medicine*, 19, 957-963.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, 59, 329-349.

Appendix

Statistical Evidence and Narrative Messages

Statistical Evidence Messages 1 and 2

In 1991, a total of 16,003 people received kidney, heart, or liver transplants in the United States. This may seem like a large number of transplants until you consider that a total of 26,463 people in the United States were in need of kidney, heart, or liver transplants. While many people have shown that they are aware of the need of their fellow human beings by

carrying signed and witnessed organ donor cards, the need for organ donations clearly is not being met. The need for organs and tissues can only be provided for if as many people as possible register themselves as donors. You can show that you are aware of this need, and demonstrate your compassion and humanity by becoming an organ donor. It is important that you realize several facts:

1. The effectiveness of organ and tissue transplantation is well established and its potential continues to expand.
2. To increase the supply of organs and tissues, individuals must learn about the importance of transplantation and the need for donation.
3. Research has shown that family discussion increases the likelihood of actual donation.
4. Every individual should be encouraged to discuss donation with his or her family, to decide whether or not to donate, and to communicate this decision to family members.

OR

1. Carrying a signed donor card does not increase the chance of harm coming to someone.
2. Organ removal is performed by a team of specialists so that it cannot be seen that the deceased has donated.
3. There is no charge for the organ removal procedure.
4. Even though it will probably be quite a while before you pass away, it is never too soon to consider becoming an organ donor.

You can decrease the shortage of tissues and organs by filling out a donor card, signing it, and having it witnessed, preferably by a family member. Show your compassion and humanity by becoming an organ donor today!

Narrative 1

On a bright fall morning, 20-year-old Dan Chandler was walking with a friend on his way to class at Michigan State University. As he stepped off the curb to cross the street, Dan did not see the car that raced around the corner, struck him and drove away. Dan collapsed on the ground with a severe brain hemorrhage. Within days he died—and because he had signed an organ donor card and talked with his parents about his wishes last summer when he was home, Dan became an organ donor.

The number of people in need of organs in the United States has reached about 31,500—the same as the number of undergraduate students at M.S.U. One organ donor can save at least six lives, and 13-year-old Alicia Cotton may have been one of those saved by Dan's donation. Alicia was diagnosed as having a fatal disease at five weeks of age. Recently she received her second liver transplant and has been recovering well. "When things get hard," Alicia's mother Marva Cotton says, "I think about the two families that donated livers to save my child." A week after the transplant, the Cotton family received the news that Alicia should have no further complications from the transplant. "So they're telling Alicia to go out and have a nice life," asks her father. Marva Cotton's laugh has a southern accent. "You got that right!"

Two-and-a-half-year-old Pamela Hall is another who was saved thanks to an organ donor. She was admitted to a hospital with third-degree burns on 66 percent of her body and doctors gave her no chance of survival. Pamela's condition stabilized after the doctors had removed the burned skin and temporarily replaced it with skin from an organ donor to cover the wounds until skin cultured from her own cells could be produced. A few short weeks afterward, the little girl was well enough to pedal down a hospital hall on her tricycle.

Alicia and Pamela both were given another chance at life because Dan Chandler took the time to sign an organ donor card and to discuss this decision with his parents. Many others could also be saved if there were more people like Dan.

Narrative 2

It was a little past 8 p.m. on a chilly night in March. Lisa Kelly and her friend Joanne, both sophomores in college, made their way across campus to the library. Lisa and Joanne had developed a close friendship after living together for almost two years in the dorms. As they walked, they talked about their plans for the summer. Each had decided to work and they hoped to find jobs close enough for each of them to be able to see one another and their families.

As they continued toward the library, Lisa told Joanne that she wasn't feeling well. Stopping to rest for a minute, Lisa placed both of her hands on her head and then collapsed. Joanne screamed for help and several people rushed to help her. Soon an ambulance arrived and Lisa was rushed to the hospital. Joanne called Lisa's parents, whom she had met when Lisa invited her home on several occasions her first year in school. She knew that they would want to know.

When Lisa's parents arrived, the doctor told them that she had suffered a severe brain hemorrhage and was not expected to live. For three days, Lisa's friends and family stayed with her at the hospital, but her condition only worsened. On the fourth day, her parents signed the permission form to disconnect her life-support system. Lisa died immediately. Because they knew her wishes, her parents gave permission for Lisa's organs to be donated.

Within hours, skilled surgical teams removed her organs and sped them to waiting recipients. Lisa's heart went to a 35-year-old father of two. The liver forestalled the death of a 19-year-old college student. One of her kidneys went to a teacher who had been on dialysis for five years, while the other kidney was given to a young wife and mother of three youngsters. Lisa's eyes were removed so that her corneas could restore sight for two blind people.

Although Lisa's death was a tragedy, her parting gift to the world, her donated organs, saved the lives of four other people and greatly enhanced the lives of two others. This was possible because Lisa had thought about organ donation before, even though she never thought she would die this soon. Lisa had discussed the issue of organ donation with her family, and together they had signed donor cards. Because of her forethought, Lisa was able to help six other people who may not have lived without her organs.

Copyright of Journal of Applied Communication Research is the property of National Communication Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.