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UNDERSTANDING THE WILLINGNESS TO BECOME A POTENTIAL ORGAN DONOR: AN AUDIENCE ANALYSIS AND SEGMENTATION

By

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ABSTRACT

UNDERSTANDING THE WILLINGNESS TO BECOME A POTENTIAL ORGAN DONOR: AN AUDIENCE ANALYSIS AND SEGMENTATION

By

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A critical need for organ donors exists in the United States today. Developing an effective communication campaign to increase the number of potential donors involves extensive research as the population has varying attitudes and beliefs about organ donation. This research makes a two-fold attempt at beginning a campaign to increase the number of people signing organ donor cards. First, an audience analysis is conducted using a model incorporating the Theory of Reasoned Action to explain the constructs leading to willingness to sign a donor card. Then, audience segmentation allows an understanding of the different target audiences involved in the campaign. The results of this research are essential for creating health campaign messages that will persuade more people to sign organ donor cards thus increasing the pool of potential donors. Utilizing a well-known persuasion theory to formulate the model presented, this research offers a more theoretical grounding in the persuasion literature than previous explanations of organ donation.

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INTRODUCTION

"Clearly there is a pressing need for research that can potentially increase the supply of organs available for transplantation" (Horton & Horton, 1991). Logically, to increase the number of organs, it is necessary to increase the number of individuals who indicate that they would be willing to donate their organs upon death. This desire is usually expressed in the form of a signed organ donor card. Health communication campaigns can be developed with the intent of increasing the number of signed donor cards in a population, but several stages are usually needed in the planning of these campaigns. The goal of this research is to focus on one preliminary stage of an organ donation campaign and try to understand the relationships between individuals' attitudes toward organ donation, and their willingness to carry a signed donor card. In that effort, a theoretical model will be developed to predict the relationships between variables leading to the willingness to sign a donor card. Knowledge gained from examining these relationships will enable health campaign researchers and medical professionals to take steps toward developing more effective health campaigns that will persuade more individuals to sign donor cards, thus increasing the potential supply of organs.

Health communication campaigns have long been the focus of many communication scholars' attention. Several researchers have even proposed detailed models for

implementing health campaigns that include five (Maibach, Kreps, & Bonaguro, 1993) to seven (McGuire, 1989; Flay & Burton, 1990) steps to completing an effective campaign. Included in each of these models is a recommendation to employ audience analysis and segmentation as steps toward a successful campaign. "Although planning and theoretical considerations are important steps in setting up a strategic campaign, communication analysis is at the core of the planning process" (Maibach, Kreps, & Bonaguro, 1993, p. 23).

The proposed research will attempt to develop a two-fold understanding of the different audiences that may be targeted in a health campaign designed to persuade individuals to sign organ donor cards. First, an audience analysis will be developed through the use of a model of willingness to donate organs. The Theory of Reasoned Action will be examined for its understanding of the relationship between attitudes and behaviors, and then previous research attempting to model organ donor willingness will be discussed. Both literatures will be combined to develop a comprehensive picture of willingness to sign an organ donor card. The model that is subsequently proposed should generate a global understanding of the cognitive elements which contribute to an individual's decision to become an organ donor. Second, the audience will be segmented into three distinct groups in order to develop a comprehensive profile of the target audiences that may be the focus of a campaign to increase the number of organ donors.

In combination, the information gained through this research should prove to be a useful step toward the development of a health campaign to increase organ donation.

LITERATURE REVIEW AND HYPOTHESES

Audience Analysis: Proposed Model of Willingness

Theory of Reasoned Action

In order to attempt to understand the relationship between attitudes and behaviors, Fishbein and Ajzen (1975) developed the Theory of Reasoned Action. This theory suggests that individuals' behavior is directly influenced by their intention to engage in the behavior, which in turn, is affected both by the individuals' attitudes toward the behavior and by their subjective norm. The subjective norm is usually comprised of the individual's perception of the attitudes of important others as to whether or not s/he should engage in the behavior, as well as the individual's motivation to comply with the wishes of these important others. The model of this theory can be illustrated simply as shown in Figure 1.

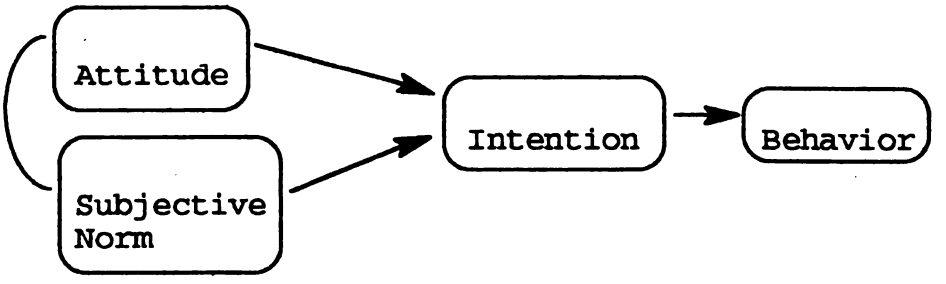

Figure 1. Illustration of Theory of Reasoned Action

Model of Willingness to Become a Potential Organ Donor

While the Theory of Reasoned Action specifies a general relationship between attitudes and behavior, Horton and Horton (1991) have developed a model specific to the domain of organ donation. Their model of the decision to become a potential organ donor contains five major conceptual variables: values, knowledge about donation, attitudes, willingness to donate, and whether or not the subject carried an organ donor card or requested one when given an opportunity to do so. (Explication and further discussion of these variables will be provided later in the paper.) Their model can be represented as shown in Figure 2.

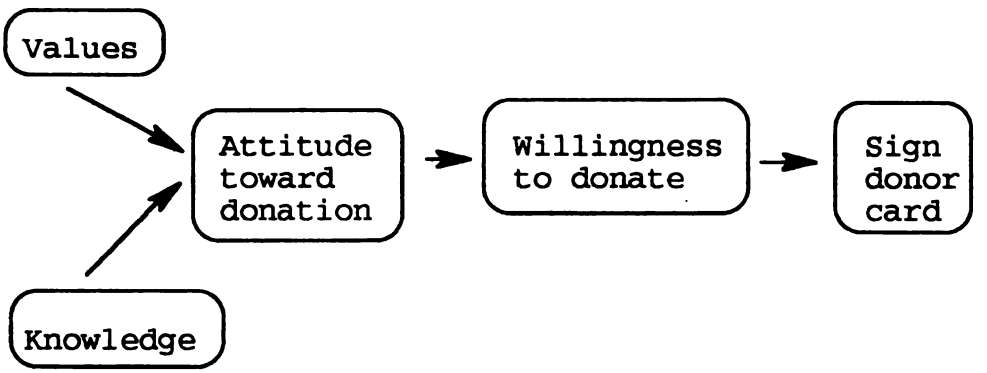

Figure 2. Illustration of Horton & Horton's (1991) Model

Developing the Organ Donor Willingness Model

While Horton and Horton (1991) did not indicate that their model was developed based on the Theory of Reasoned Action, there are many similarities between the two models. Signing an organ donor card can be viewed as a more specific behavior than Fishbein and Ajzen's (1975) generic behavioral

outcome. Similarly, willingness to donate organs is more precise than a general intention to engage in behavior. Both models also contain an attitude component, but the Horton and Horton (1991) version is more explicit as it specifies two additional variables that influence the attitude, which are values and knowledge.

Values, as described by Rokeach (1968), are abstract ideals or beliefs (positive or negative) about how one ought or ought not to behave. Using the Rokeach value survey, Horton and Horton (1991) found seven instrumental values which, together, created a significant path linking the values construct to the attitude construct in their model. The seven values were: broadminded, cheerful, courageous, forgiving, helpful, honest, and loving; all were found to comprise one underlying factor, which they labeled 'helpful', a "label that seems to capture the essence of the individual values" (Horton & Horton, 1991, p. 1040).

While the label 'Helpful' may have been useful to Horton and Horton (1991), the seven critical values also seem to be representative of another widely studied construct: "Altruism". Macaulay and Berkowitz (1970) generally define altruism as "behavior carried out to benefit another without anticipation of rewards from external sources" (p. 3). Given this definition, the act of signing an organ donor card can easily be viewed as altruism. Studies of altruism (Macaulay & Berkowitz, 1970) indicate that there are many determinants which lead to individuals' altruistic behavior, including the

values of broadmindedness, cheerfulness, courage, forgiving, helpfulness, honesty, and love, as demonstrated by Horton and Horton (1991). In addition, Macaulay and Berkowitz (1970) also account for other factors that may influence a person's willingness to perform an act of altruism, such as individuals' relationships with their parents, a desire for adventurousness, and a commitment to action. Combining the seven values from Horton and Horton (1991) with the three factors discussed by Macaulay and Berkowitz (1970) allows for the development of a stronger values construct, which in the present research will be called "altruism."

Knowledge is the second component that influences an individual's attitude as specified by the Horton and Horton (1991) model, and 'knowledge' generally refers to public understanding regarding facts about organ donation, whether accurate or inaccurate. In previous research, Horton and Horton (1990) found that knowledge regarding organ donation was found to be positively related to whether or not subjects carried or requested a donor card, their attitude towards organ donation, and their willingness to donate their own organs or the organs of a deceased loved one. In testing their model of willingness to donate organs, the link between knowledge and the attitude construct was highly significant

The only variable included in the Theory of Reasoned Action that is not accounted for by the model of willingness to donate organs is the component called the subjective norm. It is probable that individuals' intent to sign organ donor

cards may be influenced by their beliefs about how others important to them may feel should they perform this behavior. However, a key factor influencing the subjective norm is whether or not the individuals are motivate to comply with these important others. Assuming a high motivation to comply, those people who perceive that others would be pleased or even proud if they decided to donate their organs would be more likely to be willing to donate their organs, while those who perceive that others would be upset or disappointed would be less willing to sign a donor card. Thus, the subjective norm can be included in the organ donation model with a path to intention or willingness to donate organs.

Due to the similarity of variables between the two models, it seems reasonable to combine the components to form a singular model that incorporates all of the variables. While both the Fishbein and Ajzen (1975) model and the Horton and Horton (1991) model demonstrated significant power to explain relationships between the variables specified, it is expected that the model hypothesized in the present study will be a statistical and substantive improvement over the two individual models when explaining the willingness to donate organs.

Research necessitates the inclusion of one additional variable within the hypothesized model. In their discussion of public knowledge about organ donation, Horton and Horton (1990) suggest that "fear of premature action or even the

hastening of a potential donor's death are principal reasons given for not wanting to become an organ donor" (p. 797). Indeed, other researchers propose that reluctance to sign a donor card may be attributed to several different fears, including the following: the belief that the necessary hastiness associated with organ removal may lead to less medical attention or even the premature declaration of death; concern about mutilation of the body; denial of the possibility of death; concern about expenses that may be accrued by the donor's family; and concern that donated organs may be given to wealthy or influential individuals rather than someone in need, (Lenehan, 1986; Smith, Kopfman, Morrison, & Ford, 1993).

Smith, Kopfman, Morrison, and Ford (1993) demonstrated that fear does have an effect on the persuasiveness of messages designed to influence individuals to sign organ donor cards. Their results indicated that subjects who read a moderate fear message took a significantly higher proportion of brochures containing organ donor cards than did subjects who read either a low or high fear message. As these persuasive messages were intended to change individuals' attitudes about organ donation, it is clear that fear should directly influence attitude. However, the present research does not include any type of persuasive message. Without a direct manipulation of fear, it is unlikely that high levels of anxiety such as those obtained with a high-fear message will be displayed by the average

person. Rather, individuals normally are likely to possess ideas about organ donation that range from those low on a fear scale to those comparable to a moderate-fear message. Thus, a path from fear to attitude toward donation can be incorporated into the model hypothesized in the present study.

Alternatively, it is possible that an individual may have a positive attitude toward organ donation in that they believe that it is an altruistic act, and that they may hold certain fears that prevent them from intending to sign a donor card. If this is the case, then fear should directly influence a person's willingness to donate their organs. Thus, a path from fear to intent can be specified in the present model.

It is also possible that an individual's fear may be influenced by their knowledge about organ donation. A lack of knowledge may contribute to an increased sense of fear regarding organ donation simply because a person is unfamiliar with the idea just as a great deal of knowledge about organ donation may reduce an individual's fear of the process. Thus, a path from knowledge to fear may also be incorporated into the model. Combining the components just discussed with the two models developed previously, the present hypotheses regarding the process that leads to the act of signing an organ donor card can be diagrammed as shown in Figure 3.

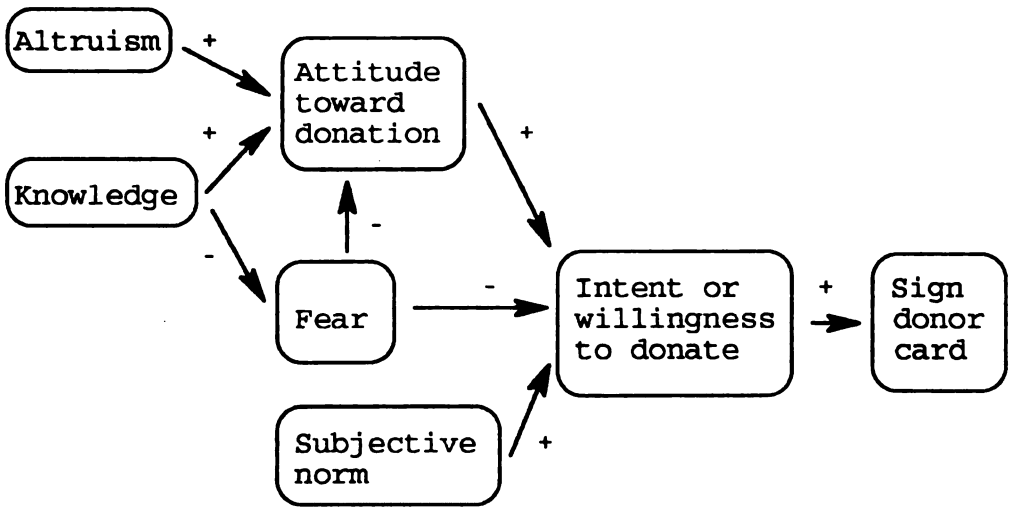

Figure 3. Illustration of the Organ Donor Willingness Model

H1: The proposed model will be a significant and substantive improvement over the Horton and Horton (1991) model.

Explaining the Model

Previous work on organ donation has attempted to explain the willingness of individuals to sign organ donor cards, but none have fully explained the phenomenon. The model of willingness to become a potential organ donor, developed by Horton and Horton (1991) presented a beginning framework for understanding this phenomenon, however their model explained only 37% of the variance. While this percentage is quite respectable, there is still a large portion of individual's willingness to sign donor cards left unexplained, and the present theory attempts to close that gap.

The Organ Donor Willingness Model (ODWM) proposed here extends the work of Horton and Horton (1991) to fit with

Fishbein and Ajzen's (1975) well-known Theory of Reasoned Action, and it also incorporates a variable recently revived in the persuasion literature, which is called fear. Specifically, this model suggests that the behavior of signing an organ donor card is predicted by an individual's willingness to donate their organs. In turn, willingness to donate is influenced by three variables: the individual's attitude toward organ donation, his/her level of fear about donation, and his/her perceptions of what important others will think of him/her becoming a donor (the subjective norm). Finally, the model predicts that attitude toward donation is influenced both by the individual's general level of altruism and by their knowledge about the subject of organ donation, and also that fear will be influenced by knowledge of organ donation.

To allow for a better understanding of the ODWM, several specific propositions of the model can be set forth. As discussed earlier, Horton and Horton (1991) found that helpfulness (called altruism here) significantly predicted attitude toward organ donation. Thus, if an individual demonstrates high levels of altruism, s/he should be more likely to hold a positive attitude about organ donation, whereas, if this individual is not very altruistic, his/her attitude toward organ donation is likely to be more negative.

> Proposition 1: As an individual's level of altruism increases, his/her attitude toward organ donation will become more positive.

Many people have heard or read about organ donation at some point in the past, and others have had indirect experience with organ donation following the death of a relative who may or may not have become a donor. These individuals are said to possess high levels of knowledge about organ donation. Other people may be aware that current medical technology allows for successful organ transplants, but they know nothing about the process through which organs are obtained. These individuals are said to possess low levels of knowledge about organ donation. As discussed earlier, Horton and Horton (1991) found that as knowledge increased, attitude toward donation was also likely to increase. Thus, those individuals that previously have been exposed to information about organ donation are likely to have a more positive attitude toward donation than those individuals that have not heard or read any such information.

> Proposition 2: High levels of knowledge about organ donation will produce positive attitudes toward donation, while low levels of knowledge about organ donation will produce negative or neutral attitudes toward donation.

Persuasion researchers have suggested that the provision of information is an effective method for overcoming fears and misunderstandings associated with organ donation (Cox, 1986; Lenehan, 1986; Osborne & Gruneberg, 1979; Stark, Reiley, Osiecki & Cook, 1984; United States Department of Health and Human Services, 1986, 1990). Thus, as factual

knowledge about organ donation increases, fears about donation should decrease. Conversely, if knowledge about organ donation remains relatively low, then a high level of fear regarding donation should be exhibited.

> Proposition 3: High levels of knowledge about organ donation will result in lower levels of fear about donation, while low levels of knowledge about organ donation will result in higher levels of fear.

While knowledge is suggested to influence both attitude and fear, fear itself is also predicted to influence attitude toward organ donation. As discussed earlier, the work of Smith, Kopfman, Morrison, and Ford (1993) demonstrated that a fearful message about organ donation can significantly change attitudes about the topic in a negative direction. Assuming that individuals potentially may receive fearful messages about organ donation from innumerable sources such as the media or interpersonal conversations, it is easy to see that these individuals are likely to possess some level of fear that, if substantial enough, may influence their attitude about donation.

> Proposition 4: Higher levels of fear about organ donation will produce negative attitudes about donation, while lower levels of fear about organ donation will produce positive attitudes about donation.

As stated earlier, there are three variables predicted to influence one's willingness to donate organs: attitude, fear, and subjective norm. Consistent with the Theory of

Reasoned Action and the Horton and Horton (1991) model, one's attitude toward organ donation is hypothesized to influence directly one's willingness to donate his/her own organs. Specifically, if an individual possesses a positive attitude toward donation, s/he should demonstrate increased willingness to donate his/her organs upon death. On the other hand, if this individual possesses a negative attitude toward donation, s/he should demonstrate decreased willingness to donate his/her organs.

> Proposition 5a: A positive attitude toward organ donation will increase willingness to donate organs, while a negative attitude toward donation will decrease willingness.

While this proposition makes intuitive sense as it stands, the two other variables influencing willingness must be considered in order to fully understand the construct of willingness to donate.

Proposition 4 suggested that fear should influence one's attitude toward organ donation, and Proposition 5a suggested that attitude toward donation will influence willingness to donate. In other words, the attitude construct was proposed to mediate the relationship between fear and willingness. It is also possible that fear may directly influence one's willingness to donate their organs upon death. It was stated earlier that it is possible for an individual to have a positive attitude toward organ donation in that they believe that it is an altruistic act, and they may hold certain fears

that prevent them from intending to sign a donor card. In this situation, fear would influence willingness directly. To account for this, Proposition 5b is offered.

> Proposition 5b: Higher levels of fear will reduce willingness to donate organs, while lower levels of fear will increase willingness to donate organs.

The third variable proposed to influence willingness is the subjective norm. Fishbein and Ajzen (1975) suggested that this construct is a function of the individual's perceptions of significant others' preferences about whether one should engage in a behavior combined with the individual's motivation to comply with the significant others. In the present model, the behavior in question is signing an organ donor card. Assuming a high motivation to comply with important others, those individuals who perceive that others would be pleased or even proud if they decided to donate their organs would be more likely to be willing to donate their organs, while those who perceive that others would be upset or disappointed would be less willing to sign a donor card.

> Proposition 5c: Perceptions of approval from significant others will lead to willingness to donate organs, while perceptions of disapproval from others will lead to unwillingness to donate.

Propositions 5a, 5b, and 5c each make intuitive sense individually, however, willingness to donate organs is a proposed to be a function of all three of these variables

acting together. Thus, some combination of attitude, fear, and subjective norms must be proposed to account for the willingness construct. It makes sense to incorporate the previous three propositions to gain an ideal understanding of willingness to donate.

> Proposition 5d: A positive attitude toward organ donation, a lower level of fear about donation, and perceptions of approval from significant others will produce willingness to donate one's organs. Similarly, a negative attitude toward organ donation, a higher level of fear about donation, and perceptions of disapproval from significant others will produce unwillingness to donate one's organs.

Finally, the last portion of the model suggests that willingness to donate organs upon death will influence whether or not an individual signs an organ donor card. This prediction is supported by Fishbein and Ajzen (1975) and Horton and Horton (1991) as well as a host of other persuasion researchers who have suggested that intent leads to behavior. In other words, an individual willing to donate his/her organs after death will be likely to sign an organ donor card, while an individual unwilling to donate will be unlikely to sign a donor card.

> Proposition 6: Willingness to donate will result in a signed organ donor card, while unwillingness will result in an unsigned donor card.

Audience Segmentation: Discriminant Analysis

"Audience segmentation strategies can improve campaign effectiveness by targeting specific messages to particular

audiences" (Rogers & Storey, 1987). Campaigns that target a relatively homogeneous audience rather than a large heterogeneous population are more likely to be successful as messages can be targeted to meet the specific audience's needs. This process also increases the likelihood that audience members will pay attention to the message, be persuaded by the message, and adopt the recommendations within the message (Maibach, Kreps, & Bonaguro, 1993).

Often, pre-existing attitudes of the population are used to divide the population into the target audiences (a process commonly referred to as psychographic segmentation) (Maibach, Kreps, & Bonaguro, 1993). On the topic of organ donation, attitudes may range from those entirely supportive of the process to those extremely fearful at the mention of the phrase. The present research will help identify target audiences that share similar perspectives on organ donation. Specifically, the larger population will be broken down into three groups: individuals who currently hold signed organ donor cards, individuals high in intent to sign donor cards, and individuals low in intent to sign donor cards. Analysis of the variables measured in the proposed model is expected to demonstrate that the three groups differ significantly in their scores on the various constructs. In order to understand the groups, it is necessary to understand how their responses result in discriminant functions with significantly different loadings in a discriminant analysis. These results will allow the development of comprehensive

profiles describing the three groups and the factors that lead them to their present views of organ donation. The profiles can then be used to develop different messages which target the three different audiences, specifically addressing the concerns of each group.

H2: The group of individuals who currently hold signed organ donor cards will differ significantly from individuals high in intent to sign donor cards in their levels of altruism, attitude toward organ donation, knowledge, subjective norm, and fear. Individuals low in intent to sign organ donor cards will differ significantly from both groups on the same constructs.

METHODS

Subjects

To test the present model, 292 students at a large Midwestern university were asked to participate in a study about attitudes. These students were recruited from introductory communication classes, and they were given extra credit toward their course grade for participating. It should be noted that a student population is greatly desired for research about organ donation because the ideal and typical donor is a healthy young adult, and subjects in this population tend to live dangerous lives. Also, if they sign donor cards at this age, they are likely to continue to carry them throughout their lifetimes (Horton & Horton, 1991; Smith, Morrison, Kopfman, & Ford, 1994).

Measures and procedures

The instruments used to collect data were similar to those used by Horton and Horton (1991), with the addition of several measures to assess the variables not incorporated into their model. Upon arrival, participants were given a questionnaire booklet, and they were asked to complete the instruments in the order that they were presented. The order of administration of the measures was: altruism, attitudes, knowledge, subjective norm, fear, and willingness to donate. The purpose of this order was to obtain an uncontaminated measure of altruism and to conceal the purpose of the study for as long as possible.

To measure altruism, a 26-item scale (alpha = .88) which asked subjects to indicate their agreement on a seven-point scale ranging from "Strongly Agree" to "Strongly Disagree" was used (see Appendix A). The Rokeach value survey, as used by Horton and Horton (1991), indicated that seven of the 36 values assessed were significantly related to a person's willingness to donate their organs. Two indicators for each of the seven crucial values were developed by the author such that one item directly assessed the value while the other item was reflected. The reflected items were recoded prior to data analysis. The additional 12 items included in this measure were developed utilizing previous research (Macaulay & Berkowitz, 1970) which discussed the three indicators of altruism previously discussed: relationship with parents, desire for adventure, and commitment to action.

The attitude construct was assessed using an 8-item measure (alpha = .93) developed by combining portions of the Goodmonson and Glaudin (1971) measure of attitude toward organ donation (used by Horton and Horton, 1991) with several items from an attitude scale developed by Smith, Morrison, Kopfman, and Ford (1994) (see Appendix B). Each item consisted of a belief statement with which respondents were asked to indicate their agreement on a seven point Likert scale from "Likely" to "Unlikely" and from "True" to "False." To be as consistent as possible with the Theory of Reasoned Action, an item assessing the strength with which each belief is held followed each belief statement, so that the product of the responses to the belief statement and the belief strength comprised the attitude measure for each item. The evaluation of beliefs were measured with items which evaluated the belief statements on a seven point Likert scale from "Good" to "Bad" and from "Harmful" to "Beneficial."

Knowledge was assessed using 21 statements about organ donation (see Appendix C) that are unequivocally either true or false. These statements were developed by Horton and Horton (1990) to represent public facts about organ donation. Participants were asked to indicate whether they believed each statement to be true or false. Overall, these reliability of these items was rather small (alpha = .37), but to be consistent with the analysis of Horton and Horton (1991) this measure was separated into two indicator measures. "The first set, labeled barrier questions in the

literature review because incorrect knowledge seemed to represent clear obstacles to or reasons for not becoming a potential organ donor, were four questions that were answered correctly least often by subjects. The second set of 17 questions were answered correctly much more frequently than the first" (Horton & Horton, 1991, p. 1040). Cronbach's alpha for the barrier questions was .56, while the remainder of the knowledge measure yielded an alpha of .37.

The subjective norm was measured in several parts (see Appendix D). First, participants were asked to list four individuals whose opinion is very important to them. Then for each of the individuals listed, the participants completed a series of seven point Likert scale items in response to the question stating "If I would sign an organ donor card to indicate that I wished to donate my organs upon my death, this person would be _____." Responses ranged from "Interested" to "Indifferent"; "Pleased" to "Displeased"; "Upset" to "Comforted"; "Worried" to "Not Worried"; and "Angry" to "Happy." Finally, participants were asked to indicate on a seven point Likert scale how likely they would be to comply with each individual's expectations for their behavior. A score was computed for each "important other" for each subject by summing the responses to the semantic differential items and then multiplying this by the response given for their likelihood to comply with this person. Cronbach's alpha for the subjective norm scale was .84.

Fear was assessed in the present study using a thought-listing technique which asked the subjects to list any thoughts or feelings they may have about organ donation (see Appendix E). This technique was employed in order to ensure that subjects were not sensitized specifically to any fears they had not previously considered. Once the data were collected, this measure was coded by an individual unfamiliar with the nature of this research, as well as by the author, to determine how many of the thoughts listed represent subjects' fears (Cohen's kappa = .91). A ratio of the number of fears to the total number of thoughts listed was developed for use in the data analysis.

The final measure in the questionnaire booklet assessed intent or willingness to donate organs. The items used to develop this instrument were a compilation of those used by Horton and Horton (1991) and Smith, et al. (1993). First, participants were asked whether they carried a signed organ donor card prior to completing the present study. Those responding "No" to this question were asked to indicate their agreement with six statements (alpha = .91) on a seven point Likert scale ranging from "Strongly Agree" to "Strongly Disagree." The measure included items such as "I will consider the possibility of becoming an organ donor," "I intend to become a potential organ donor," and "I plan to sign an organ donor card very soon." Similar items will assess the willingness of the participants to donate the

organs of a deceased loved one, or to discuss the issue of organ donation with family members.

A final section of the questionnaire requested demographic information from the participants, such as their age and sex. Participants also were given the option to remove a brochure containing information about donation and an actual organ donor card that could be signed and placed on their drivers' licenses. The removal of this card from the booklet was a behavioral indicator of the participants' willingness to donate organs.

ANALYSIS

Once all of the data were gathered, coded, and combined to form reliable indicators of the constructs, the proposed model was tested through the use of correlation and regression procedures, as well as path analysis and LISREL. A comparison was made between the results of the present study and those of Horton and Horton (1991) to assess whether or not the present study was a statistical and substantive improvement over the earlier model.

Additionally, a discriminant analysis was performed in order to obtain comprehensive profiles of the three different groups of people comprising relevant target audiences for persuasive messages about organ donation: those who already carry a signed organ donor card, those high in intent to sign an organ donor card, and those low in intent to sign an organ donor card.

RESULTS

Testing the Propositions

Both correlation analysis[1] and regression procedures were employed to test the propositions of the ODWM, and encouraging results were found in all cases. See Figure 4 for a comprehensive picture of the model with correlation and regression coefficients.

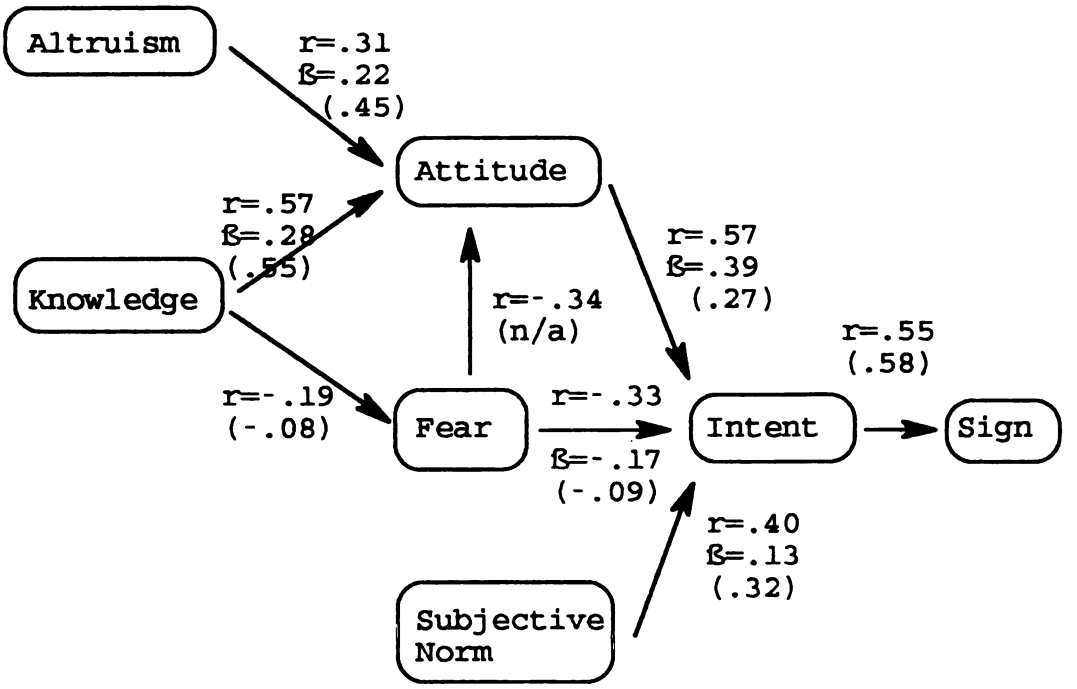

Figure 4. The Organ Donor Willingness Model with Regression Coefficients and LISREL Path Estimates (LISREL path coefficients are denoted within parentheses)

Proposition 1 suggested that as altruism increases, attitude toward organ donation should become more positive, and the data were consistent with this proposition as is evidenced by a positive and significant correlation between the altruism

and attitude measures ($r = .31$, $p < .01$). Proposition 2 hypothesized a positive linear relationship between knowledge about donation and attitude toward donation such that as knowledge increases, attitudes will become more positive. The data also were consistent with this proposed relationship ($r = .57$, $p < .01$). Multiple regression was used to examine the combined effects of altruism and knowledge on attitude. Results indicated that both variables were significant predictors of attitude, but that knowledge ($ß = .28$, $t = 4.90$, $p < .00$) was slightly more significant that altruism ($ß = .22$, $t = 3.81$, $p < .01$). The multiple correlation coefficient for this equation was substantial ($R = .37$) and significant ($F = 21.37$, $p < .00$).

A linear relationship with a negative slope between knowledge and fear was advanced in Proposition 3 such that as knowledge increases, lower levels of fear should be demonstrated. This relationship was found to be significant ($r = -.19$, $p < .05$), although was the weakest correlation reported in support of the propositions offered here. Fear was also suggested to evidence a negative linear relationship with attitude such that high levels of fear should produce negative attitudes about organ donation, and the data were significant and consistent with Proposition 4 ($r = -.34$, $p < .01$).

The relationships advanced in Propositions 5a, 5b, and 5c were examined for their correlational significance, while multiple regression was used to examine Proposition 5d. The

positive linear relationship between attitude and intent to donate organs ($r = .57$, $p < .01$) demonstrated that the data were consistent with Proposition 5a, while the negative linear relationship between fear and intent ($r = -.33$, $p < .01$) suggested that there was also support for Proposition 5b in that the relationship was significant but in the opposite direction than predicted. A significant correlation between subjective norm and intent ($r = .40$, $p < .01$) indicated that data were consistent with Proposition 5c which suggests that perceptions of approval from others will lead to willingness to donate organs while perceptions of disapproval will lead to unwillingness. Given these encouraging results, a multiple regression was performed in order to examine the individual impact of each variable on intent, and the results clearly indicate that fear, attitude, and subjective norm were all significant predictors of intent to donate organs. Attitude was the most significant predictor of the three ($ß = .39$, $t = 6.23$, $p < .00$), followed by fear ($ß = -.17$, $t = -2.73$, $p < .01$), and finally subjective norm ($ß = .13$, $t = 2.07$, $p < .04$). The multiple correlation coefficient for this equation was substantial ($R = .55$) and significant ($F = 28.92$, $p < .00$).

Finally, the relationship between intent and behavior (Proposition 6) was examined using logistic regression procedures, as the dependent variable, behavior, was measured dichotomously by noting whether or not the subject removed the organ donor brochure. With an estimated odds ratio of

1.16, the results of this analysis indicated that the intent -behavior relationship was indeed significant (Wald = 49.10, df = 1, $p < .01$) and the predicted relationship offered an excellent fit to the observed data (chi-square = 202.2, df = 221, $p < .81$), which was a significant improvement over the expected model (chi-square = 73.01, df = 1, $p < .01$). Thus, the data are consistent with the relationship suggested in Proposition 6.

Testing the model

In order to assess Hypothesis 1, it was necessary to test the entire model by determining how closely the data fit with the proposed model. Two statistical packages were employed to examine the fit of the data: Hunter's path analysis program (Hunter, Cohen, & Nicol, 1982) and LISREL7 (Joreskog & Sorbom, 1981). Results from the path analysis indicated that the data may not fit the model (chi-square = 24.34, df = 11, $p < .02$), however results from LISREL7 may indicate otherwise.

"To test the model fit, the observed model (the data) is compared to the estimated model (the structural model that the researcher develops). If these models are not significantly different from each other, then the data is said to fit the model and the theory is supported....Because the chi-square determines whether the observed model differs significantly from the estimated model, a low, insignificant chi-square is desirable" (Witte, 1991, p.16). Since the results of the present study yield a high, significant chi

-square (chi-square = 732.16, df = 297, $p < .00$), this indicates that the data do not adequately fit the model, and support is not gained for the theory. However, the chi -square statistic is not the only indicator of model fit as it is extremely sensitive to sample size. Hayduk (1987) notes that "large data sets are likely to produce significant chi-squares, not because the fit between [the observed and estimated models] is any worse, but because with large sample sizes, smaller differences are detectable as being more than mere sample fluctuations" (p. 168, italics omitted). Thus, the relatively large sample size of 292 is at least partially responsible for this poor fit.

Examination of other statistical indicators is more encouraging in suggesting support for the theoretical model. The goodness-of-fit index was reported to be .844, and the root mean square residual was .068, indicating that the goodness of fit was relatively high while the residuals were relatively low. These numbers suggest a good, but not outstanding, fit between the data and the model. Another alternative test for model fit is the chi-square to degrees -of-freedom ratio. According to McPhee and Babrow (1987), if this ratio is less than five, then a model is said to fit. In the present study, the ratio of chi-square (732.16) to degrees of freedom (297) is 2.47, which is well below five, and thus, indicates that the data may indeed fit the theoretical model.

Joreskog and Sorbom (1989) suggest that the chi-squares of different models be assessed to determine improvements in fit. To do so, the chi-square and degrees of freedom for one model are subtracted from the same statistics of the second model, and this new figure is examined for significance. This process can be employed to determine whether the present model is a significant improvement over the original model developed by Horton and Horton (1991), and in doing so, Hypothesis 1 can be examined. In the Horton and Horton (1991) study, LISREL analyses suggested that the chi-square was 169.0 with 74 degrees of freedom. In the present research, chi-square was reported to be 732.16 with 297 degrees of freedom. The difference between these two models yields a chi-square of 563.16 with 223 degrees of freedom, and this statistic is significant, thus indicating that the data are consistent with Hypothesis 1, and the proposed model offers a substantial improvement over the Horton and Horton (1991) model.

Discriminant analysis

Prior to performing the discriminant analysis procedures, it was necessary to combine individual items from the questionnaire into a smaller number of indicators for the construct labelled "altruism". To do so, the items measuring altruism were subjected to factor analysis procedures. The results yielded five individual factors for altruism with reliabilities ranging from alpha = .70 to alpha = .83. (See

Appendix G for a list of items included in each factor along with the reliability for each factor.)

Hypothesis two suggested that three groups of people relevant to an organ donation campaign (individuals who have signed donor cards, individuals high in intent to sign donor cards, and individuals low in intent to sign donor cards) would have very different profiles when examining the variables of altruism, attitude toward organ donation, knowledge, subjective norm, and fear. A discriminant analysis procedure was employed to test this hypothesis (McLaughlin, 1980). The means and standard deviations for the three groups on each of the 20 variables are given in Table 1.

The first step was a test of the null hypothesis by means of a direct nonstepwise procedure. The standardized discriminant functions and their respective eigenvalues are given in Table 2, and the summary statistics associated with the two discriminant functions are presented in Table 3. The results of this test indicate that the null hypothesis may be rejected, as the conjoint effects of the functions and the independent effects of both functions produce significant differences among individual low in intent, high in intent, and those who hold donor cards.

Since the results of the direct discriminant procedure indicated that the centroids for the three groups were significantly different, it then was appropriate to use a stepwise procedure to select the best of the discriminating

Table 1

Means and Standard Deviations for each Variable by Intent to Sign an Organ Donor Card

Variable	Low Intent (N = 103)		High Intent (N = 120)		Has Donor Card (N = 65)	
	Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
ALTFAC1	5.94	3.57	5.92	3.59	6.23	4.17
ALTFAC2	13.36	5.21	10.62	3.43	10.72	5.25
ALTFAC3	14.44	5.15	12.51	4.49	12.55	5.15
ALTFAC4	12.34	3.84	10.40	3.67	10.68	4.99
ALTFAC5	8.33	4.24	7.64	2.62	8.23	4.68
ATTITU1	9.83	3.97	6.30	2.44	5.31	2.90
ATTITU2	49.25	43.89	26.74	23.94	25.45	29.10
ATTITU3	155.46	80.83	106.82	82.06	59.83	55.19
ATTITU4	53.60	59.35	32.94	52.73	20.81	21.85
ATTITU5	49.65	59.71	22.48	24.98	20.55	24.00
ATTITU6	46.95	42.72	24.94	23.94	23.63	29.24
ATTITU7	37.59	53.65	18.58	13.80	19.53	20.31
ATTITU8	9.19	5.71	5.08	3.51	3.78	2.23
FEARMEAS	.36	.40	.14	.29	.09	.23
KNOWBARR	1.10	.92	1.32	.87	1.72	.96
KNOWREST	12.77	1.91	13.56	1.71	13.56	2.09
SNORMA	47.93	26.79	40.16	29.90	33.55	29.22
SNORMB	54.69	38.42	40.55	31.46	39.88	35.31
SNORMC	59.47	38.01	48.31	33.52	32.19	29.45
SNORMD	59.64	32.89	49.90	32.40	45.45	45.03

Table 2

Standardized Discriminant Functions for Descriptive Variables of Low Intent, High Intent, and Had Donor Card (Direct Method)

Variables	Standardized Functions	
	Function 1	Function 2
ALTFAC1	-0.127	0.026
ALTFAC2	0.064	-0.037
ALTFAC3	0.300	-0.089
ALTFAC4	0.142	0.088
ALTFAC5	-0.217	0.153
ATTITU1	0.388	-0.151
ATTITU2	-0.062	0.040
ATTITU3	0.323	-0.327
ATTITU4	0.104	-0.216
ATTITU5	-0.012	-0.037
ATTITU6	0.187	0.204
ATTITU7	0.069	0.259
ATTITU8	0.236	-0.032
FEARMEAS	0.175	0.176
KNOWBARR	-0.159	0.432
KNOWREST	-0.092	-0.314
SNORMA	0.025	-0.218
SNORMB	-0.229	0.326
SNORMC	0.212	-0.569
SNORMD	0.094	0.073
Eigenvalue (% variance)	1.050 (81.32)	0.241 (18.68)

Table 3

Summary Statistics of Discriminant Functions (Direct Method)

Discriminant function	Canonical R	Wilk's Lambda	X2	df	P
1	0.716	0.393	221.284	42	.000
2	0.441	0.806	51.196	20	.000

variables. The standardized discriminant function coefficients that resulted from the stepwise analysis are provided in Table 4 with the corresponding eigenvalues and percentage of variance, and the summary statistics are given in Table 5. These results indicate that thirteen of the twenty variables entered make a significant contribution to the discrimination between groups, and combined, these thirteen variables are sufficient to reduce Wilk's lambda to 0.403, thus indicating that among-group differences account for 60% of the variation in the discriminant space.

The effect of Function 1 is to separate individuals low in intent to sign a donor card from those high in intent, while the effect of Function 2 is to contrast individuals high in intent from those who already have a signed donor card. After examination of the standardized canonical discriminant function coefficients, it is obvious that individuals' scores on the items assessing their general attitude toward signing an organ donor card (listed as ATTITU1 on all tables) and their belief that signing an organ

Table 4

Standardized Discriminant Functions for Descriptive Variables of Low Intent, High Intent, and Had Donor Card (Stepwise Procedure)

Variables	Standardized Functions	
	Function 1	Function 2
ALTFAC3	0.336	-0.055
ALTFAC5	-0.201	0.167
ATTITU1	0.384	-0.175
ATTITU3	0.343	-0.353
ATTITU4	0.110	-0.212
ATTITU6	0.192	0.216
ATTITU7	0.070	0.250
ATTITU8	0.223	-0.034
FEARMEAS	0.175	0.187
KNOWBARR	-0.163	0.413
KNOWREST	-0.092	-0.307
SNORMB	-0.180	0.270
SNORMC	0.226	-0.594
Eigenvalue (% variance)	1.014 (81.41)	0.232 (18.59)

Table 5

Summary Statistics of Discriminant Functions (Stepwise)

Discriminant function	Canonical R	Wilk's Lambda	X2	df	P
1	0.710	0.403	218.480	28	.000
2	0.434	0.812	50.093	13	.000

donor card would be scary (ATTITU3) are most important in determining whether they will demonstrate low or high intent to sign a donor card. Scores on items measuring cheerfulness and warmth in the altruism scale (ALTFAC3) are also quite important in determining Factor 1 of the discriminant function, as are scores on one of the measures of subjective norm (SNORMC), on the items assessing attitude about donation as a negative procedure (ATTITU8), and on the items tapping helpfulness and truthfulness in the altruism scale (ALTFAC5).

To distinguish between individuals high in intent and those who already have a signed donor card, scores on two of the four measures of the subjective norm are important variables to consider (SNORMC and SNORMB). Individuals' knowledge about organ donation, including both the barrier questions (KNOWBARR) and the general knowledge measure (KNOWREST), also contribute significantly to the second function, as do their scores on the attitude items measuring the belief that signing an organ donor card would be scary (ATTITU3) and the belief that signing an organ donor card would indicate that a person would like his/her organs donated after death (ATTITU7). Level of fear about donation (FEARMEAS) plays a significant role in both of the discriminant functions but is not as important as the variables just discussed.

These results indicate that a high score on Function 1 corresponds with positive attitudes toward signing an organ donor card and organ donation as a positive procedure, the

belief that signing a donor card may not be scary, a predisposition toward cheerfulness, warmth, helpfulness and truthfulness, and the perception that at least one other person would be happy or pleased should an organ donor card be signed - all of which are characteristic of an individual high in intent to sign a donor card. On the other hand, a low score on Function 1 is associated with an individual low in intent to sign a donor card who typically demonstrates a negative attitude toward signing a card, views organ donation as a negative procedure, believes that signing a card would be scary, is not usually cheerful, warm, helpful, or truthful, and who perceives that at least one other person would be disappointed or upset should this individual sign a donor card.

A high score on Function 2 corresponds with the perception that at least two other important people would be pleased with a signed organ donor card, a high level of knowledge about organ donation especially facts that others tend not to know, the belief that signing an organ donor card would not be scary, and the belief that a signed donor card would indicate that a person would like his/her organs donated after death - all of which are characteristic of an individual who already possesses a signed organ donor card. A low score on Function 2 is representative of an individual high in intent to sign a donor card who has a somewhat lower level of knowledge about donation, who believes that signing

a donor card may be scary, and who may not have understood that signing a donor card would indicate the wish to donate organs.

The discriminant analysis procedure (McLaughlin, 1980) was effective in differentiating between the three groups, as individuals low in intent to sign a donor card were significantly different from those high in intent to sign ($F = 12.10$, $df = 14,234$, $p < .00$), and from those who already had a signed donor card ($F = 14.65$, $df = 14,234$, $p < .00$), and individuals who already had a signed donor card were significantly different from those high in intent to sign a card ($F = 4.56$, $df = 14,234$, $p < .00$). Thus the data are consistent with Hypothesis 2, which suggested that the three groups would differ significantly in their levels of altruism, attitude toward donation, knowledge, subjective norm, and fear.

The next step in this part of the analysis was to evaluate the effectiveness of the variables as predictors of intent (McLaughlin, 1980). A Box test on the group covariance matrices showed that they were significantly different (Box's $M = 894.89$, $F = 3.90$, $df = 210$, $p < .00$). Thus, a classification procedure was performed, and the results are provided in Table 6. Sixty seven percent of the data cases could be correctly classified using the thirteen variables found to be significant in the discriminant analysis. Errors in reclassifying the original subjects occurred mainly for the high intent individuals and those who

already have signed donor cards, as these two groups were mistakenly classified as each other approximately one fourth of the time. It is possible to conclude, then that there is a subset of thirteen of the original variables which are useful in predicting intent to sign an organ donor card with a moderate degree of accuracy.

Table 6

Classification Results

Actual Group	No. of Cases	Predicted Group Membership 1	2	3
Low intent	90	66 (73%)	18 (20%)	6 (7%)
High intent	105	14 (13%)	63 (60%)	28 (27%)
Had card	59	4 (6%)	14 (24%)	41 (70%)
Ungrouped Cases	1	1 (100%)	0 (0%)	0 (0%)

Percent of "Grouped" Cases Correctly Classified: 67%

DISCUSSION

The Organ Donor Willingness Model (ODWM) presented in this paper provides a theoretical framework for understanding the variables that lead an individual to sign an organ donation card and become a potential organ donor. A total of nine propositions were advanced to describe the ODWM, and analyses indicated that data were consistent with all nine of

these propositions. Specifically, results indicated that as an individual's level of altruism increases and as his/her level of knowledge about organ donation increases, his/her attitude toward donation will become more positive. Also, as knowledge increases, level of fear about organ donation will decrease, thus also contributing to a positive attitude toward the topic. This positive attitude about donation then combines with the low level of fear as well as a subjective norm component to predict willingness to donate. Intent (or willingness) can then be used to predict whether or not an individual will perform the behavior of selecting and signing an actual organ donor card.

While examination of the individual propositions provided significant and encouraging results, analysis of the entire model was not as simple. Initial goodness-of-fit results indicated that the data did not support the model as predicted, however it was noted that this insignificance could be attributed to the large sample size. Additional statistical indicators were examined and were found to suggest not only that the data may indeed fit the theoretical model, but also that the present model is a significant and substantive improvement over the Horton and Horton (1991) model, as proposed in Hypothesis 1.

The ODWM extends previous work on predicting organ donation, specifically Horton and Horton (1991), in several ways. First, it offers more of a theoretical grounding in the persuasion literature than the Horton and Horton (1991)

model did by incorporating several aspects from Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). The subjective norm component of TRA was employed to suggest that individuals are likely to consider the views of important others when making a decision to sign an organ donor card, and this component was found to have a significant impact on intent to sign a donor card. This same theory also provided a slightly more reliable method of assessing subjects' attitudes toward organ donation than the measure employed by Horton and Horton, by first assessing agreement with a belief statement and then measuring the strength with which this belief is held. Reliability increased from 0.90 in the Horton and Horton study to 0.93 in the present research.

A second way in which this study extends the work of Horton and Horton (1991) concerns one of the variables proposed to influence attitude. Horton and Horton originally thought that an individual's values would determine his/her attitude toward organ donation, but they found that only seven of their 36 items were significant in this respect and they relabelled this construct as helpfulness. The present study expanded this component of the model to include not only the seven "helpful" values specified by Horton and Horton but also other indicators of a more comprehensive construct which was called altruism. This component of the model was found to have a significant influence on attitude toward donation, and was stronger in accounting for the

variance in attitude than the construct used by Horton and Horton (1991).

Third, the present research included the variable fear in the theoretical model to add to its predictive ability. Fear was found to have a significant impact on intent to donate organs, however there are a few limitations with this construct that must be noted. Measurement of fear was obtained by asking subjects to list any thoughts they may have about organ donation. These thoughts were then coded to determine whether or not they were fearful, and a proportion of fearful statements to the total number of statements given was used in the data analysis. With only one indicator of fear to be used in the LISREL program, this construct was underidentified, and thus, it was impossible to assess at one time all of the links in which fear was involved. Specifically, it was difficult to determine whether fear had a stronger impact on attitude (which then influenced intent) or on intent itself. A stronger and fully identified measure of fear needs to be developed for future research, however care needs to be taken to avoid sensitizing subjects to fearful issues about organ donation that they may not have previously considered. All considered, despite the limitations involved in the measurement of this construct, including fear in the theoretical model did allow for a better understanding of the factors influencing intent to sign an organ donor card, and it increased the predictive ability of the model.

A final way in which the present research improved on Horton and Horton's (1991) previous organ donation research was the use of a more immediate behavioral measure. In their study, approximately one month after completing the questionnaire, subjects received a letter explaining the need for organ donors and an addressed, stamped postcard that could be used to request an organ donor card. The response rate was only 16.4%. In the present study, participants were given the opportunity to obtain a donor card immediately upon completion of their questionnaire. This method allowed for a more specific examination of the effect of intent on behavior, since the subjects' intent was salient at the same time that opportunity was present to perform the behavior. 71% of the participants in the present research removed the brochure containing the organ donor card, which is a significant improvement over the Horton and Horton (1991) study.

In short, the model presented in this paper presents a more comprehensive picture of the factors that lead a person to sign an organ donor card. It allows for a global understanding of the various constructs that contribute to an individual's decision to become an organ donor, which can be used to develop a persuasive campaign for the general population. Specifically, a researcher could use the information provided by this model to develop persuasive messages for the general public that attempt to increase positive attitudes (by focusing on knowledge about donation

and altruism), decrease fears (by increasing knowledge), and address concerns regarding the opinions of others, since these are the three areas found to influence intent to sign donor cards.

While the ODWM itself provides valuable information about the general population, the discriminant analysis allows for the development of a more complete picture of the target audiences that may be involved in an organ donation campaign. The variables measured in the present research were able to account for 60% of the variance in level of intent to sign donor card, and they allowed for approximately two-thirds of the subjects to be accurately reclassified according to their intent. Information gained from this analysis enables the development of comprehensive profiles of the three groups of individuals: those who already possess signed donor cards, those high in intent to sign cards, and those low in intent to sign cards.

Individuals who already possess signed organ donor cards are people who have a high level of knowledge about organ donation, especially facts that others tend not to know. They do not believe that signing a donor card produces fear, and they do believe that doing so would indicate to doctors that they would like their organs removed for transplantation after their death. These individuals tend to be rather altruistic in nature, and their perception of approval from others is high with regard to their signed donor card. Targeting these individuals in a persuasive campaign would

not be a primary goal since they have already performed the desired behavior (signing a donor card), however, an understanding of them is crucial to developing an effective campaign for the other two populations of interest.

Individuals who are high in intent to sign organ donor cards are people who are somewhat knowledgeable about organ donation, but do not quite have all of the information possessed by those who already have signed cards. They may or may not believe that signing a donor card is a fearful activity, but they tend to have a positive attitude toward the donation procedure in general and toward signing a donor card, even though they may not specifically understand that a signed card expresses their wish for organ transplantation after death. These individuals tend to be predisposed toward cheerfulness, warmth, helpfulness, and truthfulness (all aspects of altruism), and they perceive that at least one other person who is important to them would be pleased if they should sign an organ donor card.

Since they are already high in intent to sign, it should not be difficult to develop messages that persuade these individuals to do so. These messages would need to target the specific knowledge gaps that separate this group of people from those who have signed cards, persuade them that signing a donor card is altruistic and not fearful, and let them know that a signed card would express their wish to donate. It may also be helpful to encourage these individuals to discuss the issue of organ donation with their

friends and family members so that they have a better understanding of the opinions of these important others on this matter. If messages with these contents could be developed, they are likely to be quite effective in changing the profile of high intent individuals to resemble that of those with signed cards.

Individuals who are low in intent to sign organ donor cards are people who tend to have inaccurate or limited information about organ donation. They typically believe that signing a donor card would be a scary activity, and that organ donation is a negative procedure. Low intent people are not overly altruistic, as cheerfulness, warmth, helpfulness, or truthfulness is not an integral part of their personality, but they do value the opinion of others as demonstrated by the fact that they perceive that at least one person who is important to them would be upset should they sign a donor card. This category of individuals presents a challenge to the researcher developing a persuasive campaign.

Since they have low intent, effort needs to be concentrated on developing messages that convince these people to consider the idea of organ donation. Increasing their level of knowledge about donation by providing not only facts but also information to contradict their fears is crucial. Since these individuals are not generally altruistic in nature, emotional appeals are not likely to be effective tools for persuading them to sign donor cards, but encouraging them to discuss the issue of donation with

friends and family members may help them realize the importance of this procedure. This discussion would also allow them to discover the true opinions of these important others, which, if positive, may help them change their views about signing. One persuasive message is not likely to convince this target audience to sign donor cards, but repeated messages in a campaign may be effective in this end.

While the information gained in the present research should prove beneficial to the development of an effective communication campaign, several limitations of the research must be acknowledged. In addition to the underidentified fear measure, the measure used to assess knowledge about organ donation produced extremely low reliabilities. One explanation for this finding may be that people gain their information about organ donation from many varying sources such as the television, magazines, brochures, and word-of-mouth from other individuals. Since this is the case, not all people gather the same bits of information (accurate or inaccurate) as others. If this is true, then an individual's knowledge about one aspect of organ donation should be unrelated to his/her information about another aspect, and one individual's set of knowledge should be unrelated to another individual's knowledge. Future research needs to examine knowledge about organ donation to determine whether individual bits of information should produce a reliable measure as well as the extent to which knowledge is shared among different members of the population.

Another possible limitation of the present research can be found in the measure used to assess the behavior of signing an organ donor card. Upon completion of the questionnaire, subjects were given the opportunity to remove a brochure containing a donor card. Removal of this brochure was used as a behavioral indicator that the subject would sign the card, however, it is impossible to know whether or not the subjects who removed the brochure actually did sign the donor card and have it witnessed. In this respect, the present research is limited to the assumption that those who did remove the brochure probably did sign the card. Future research could improve upon this study by designing a method for determining if the card is signed. Having subjects sign cards in the presence of the researcher would solve this dilemma, as would a follow-up telephone survey asking if subjects have a signed and witnessed donor card. Other additional methods also may prove beneficial. While the limitations presented by this measure are not extremely threatening, they must be considered when examining the findings of this study.

Generally, future research in the area of organ donation needs to be directed toward developing and testing messages that will be effective in persuading members of the different target audiences to sign donor cards. Information gained from the present study should prove to be quite valuable in this effort, however additional attention must be given to the role that fear plays in influencing an individual's

intent to sign a donor card. The present research demonstrated that it does have a significant impact, but a more effective method of assessing fear needs to be developed so that specific fears can be identified and addressed in persuasive campaigns.

CONCLUSIONS

Developing an effective health campaign requires quite a bit of time and effort as well as several different phases of research. The present research attempted to focus on one of the preliminary phases in a health campaign by developing a two-fold understanding of the different audiences that may be targeted in a health campaign designed to persuade individuals to sign organ donor cards. The first stage involved audience analysis through the development of a parsimonious model of the interrelationship of knowledge, fear, attitudes, and perceptions of others' opinions which lead to the willingness to donate organs. Information gained from this model should lead to a global understanding of the various constructs that contribute to an individual's decision about becoming an organ donor.

The second stage of the present research employed audience segmentation to divide the population into three relevant target audiences and develop a profile of characteristics for the subjects within each group. Understanding the attitudes and fears of each of these groups is essential in order to begin formative research, which would be the next step in developing the health campaign.

"Formative research is the mechanism through which consumer orientation is established" (Maibach, Kreps, & Bonaguro, 1993). Once the audience is segmented, formative research allows the researcher to identify the general message concepts that should be most effective in persuading the different segments of the population. It is important to focus on "what 'audience' members need rather than on 'campaigns' and possible 'message' elements" (Dervin, 1989). By isolating the needs of the audience, specific messages most likely to be effective can be developed. Formative research involving the development of persuasive messages targeted for each of the three groups of potential organ donors would be the next logical phase of a health campaign following the completion of the present research.

The implications of this research are potentially far-reaching. Knowledge about the attitudes that guide people to sign organ donor cards will enable health campaign researchers and medical professionals to develop messages that will persuade more individuals to sign donor cards, thus increasing the potential supply of organs. At the same time, the distribution of actual donor cards within the present study hopefully has increased the number of people in this area who carry donor cards, thereby increasing the potential supply of organs for those who need transplants in the Mid-Michigan area. The theory and research advanced here are just one more step toward increasing the supply of organs available for transplantation.

APPENDIX A: Altruism Measure

Based on your own values and beliefs, please indicate the extent to which you agree or disagree with the following statements:

1. I am generally a sincere and truthful person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

2. I stand up for what I believe in.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

3. I only do things that will benefit me.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

4. I am not exactly a lighthearted and happy person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

5. I enjoy doing small favors every day for the people I care about.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

6. I respect my parent(s) and we have a close, warm relationship.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

7. When people hurt me, I usually hold a grudge for a long time.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

8. I am an affectionate and tender person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

9. I don't think people need to be very receptive to other people's ideas.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

10. If I could help save somebody's life, I would do everything possible.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

11. My parents always stressed to me that helping other people is one of the most important aspects of life.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

12. A person who helps others is somebody who gives something but receives nothing in return.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

13. Overall, I tend to be a cheerful person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

14. While growing up, my relationship with my parents could almost be described as hostile.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

15. I think I am a very open-minded person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

16. To me, honesty is not the most important characteristic in a person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

17. If I help someone else, there has to be something good in it for me.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

18. I am only helpful to strangers in need when I absolutely have to be.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

19. I am willing to forgive others for their mistakes.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

20. I sometimes go along with other people's opinions just to avoid an argument.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

21. I enjoy working for the welfare of others.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

22. My family tends to do what we can to help those less fortunate than ourselves.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

23. I am usually very cold toward my parent(s), and I try to avoid them if I can.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

24. I seem to have this desire to participate in exciting, sometimes dangerous, activities.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

25. I am not what I would call a warmhearted person.

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

26. I agree with the old saying "It is better to give than to receive."

Strongly Agree	1	2	3	4	5	6	7	Strongly Disagree

APPENDIX B: Attitude Measure

Please indicate your evaluation of the following statements by circling the number closest to your opinion for <u>each</u> of the three scales under the statement:

1. In general, signing an organ donor card is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

2. I believe that organ donation is an act of compassion.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

3. Performing acts of compassion is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

4. I believe that signing an organ donor card would be a scary or anxiety-producing activity.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

5. Anxiety about signing an organ donor card is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

6. Signing an organ donor card is an unselfish and humanitarian act.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

7. Being unselfish and humanitarian is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

8. Organ donation is a natural way to help prolong others' lives.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

9. Prolonging life through organ donation is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

10. Organ donation has great benefits for all humanity.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

11. Looking out for the needs of humanity is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

12. A signed organ donor card would indicate to doctors that a person would like to donate their organs after death.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

13. Doctors knowing that individuals want to donate their organs after death is:

Good	1	2	3	4	5	6	7	Bad
Harmful	1	2	3	4	5	6	7	Beneficial
Pleasant	1	2	3	4	5	6	7	Unpleasant

14. I view organ donation as a negative procedure.

Likely	1	2	3	4	5	6	7	Unlikely
True	1	2	3	4	5	6	7	False
Probable	1	2	3	4	5	6	7	Improbable

APPENDIX C: Knowledge Measure

Please indicate whether you believe each of the following statements to be **TRUE** or **FALSE** by circling either T or F

1.	Under the Uniform Anatomical Gift Act, any mentally competent person, 18 years of age or older, can become a potential organ donor by signing an organ donation card in the presence of two witnesses who also sign the card.	T	F
2.	Once signed, an organ donation card is irrevocable.	T	F
3.	Almost all Western religious groups support the concept of organ donation.	T	F
4.	Before a donor's organs can be removed, a physician must certify that the potential donor's heart has ceased to function and that all pulmonary activity has ceased.	T	F
5.	The procedures necessary to remove a donor's organs often make it impossible to have an open casket funeral.	T	F
6.	The donor's family is not responsible for the hospital and surgery costs for removing, preserving, and transporting the donor's organs.	T	F
7.	It is considered unethical for the same physician to have primary responsibility for the care of both the organ donor and the organ donee.	T	F
8.	Anyone over the age of 40 is not acceptable as an organ donor.	T	F
9.	A benefit of donating one's organs is that, if requested, it is often possible to get sufficient compensation to offset the cost of burial.	T	F
10.	Under the Uniform Anatomical Gift Act, your wish to donate your own organs, properly documented by an organ donor card, takes legal precedence over the wishes of your next of kin.	T	F
11.	For some types of organ transplants it is less expensive to do the transplant operation than to provide terminal care for the patient.	T	F

12. A physician is legally empowered to donate, without permission of the decedent or the next of kin, the organs of a patient under his or her care who has died. T F

13. For most organs, demand is significantly greater than supply. T F

14. Large sample surveys, such as Gallup, show that the majority of Americans in-principle support the concept of organ transplantation. T F

15. If death occurs in a hospital, the potential donor can be virtually certain that his or her organs will be transplanted. T F

16. The process of organ donation generally does not result in any significant delay in normal funeral arrangements. T F

17. Brain death occurs when there is irreversible cessation of all functions of the entire brain, including the brain stem. T F

18. A majority of states now have so-called "presumed consent" laws that presume that a deceased person has given consent to have his or her organs removed for purposes of transplantation unless a written declaration to the contrary exists. T F

19. For an organ donor card to be valid, a copy must be filed with the U.S. Department of Health and Human Services. T F

20. The 'ideal' donor is a young adult who has died of a head injury, T F

21. Organ donors tend to come, relative to the size of the population, equally from all racial and socioeconomic groups. T F

APPENDIX D: Subjective Norm Measure

Please write down the names of four people (other than yourself!) whose opinion is very important to you. These people may include parents, siblings, other relatives, friends, significant others, or anyone else whose opinion you value. You do not need to list the complete names of these people - first names only or nicknames are fine as long as you can distinguish each from the others.

1. _____

2. _____

3. _____

4. _____

Please place a checkmark next to the name of each person that is an immediate family member.

Now, for <u>each</u> of the names you listed above, please answer the following questions by circling the number which most closely represents how you think each person would feel if you would sign an organ donor card.

The name of the FIRST person on my list is _____.

If I would sign an organ donor card to indicate that I wished to donate my organs for transplantation upon my death, this person would be . . .

Pleased	1	2	3	4	5	6	7	Displeased
Interested	1	2	3	4	5	6	7	Indifferent
Upset	1	2	3	4	5	6	7	Comforted
Worried	1	2	3	4	5	6	7	Not Worried
Angry	1	2	3	4	5	6	7	Happy

This person is likely to have certain expectations about how they think you should behave. How likely is it that you would comply with this person's expectations?

Not at all Likely 1 2 3 4 5 6 7 Extremely Likely

The name of the SECOND person on my list is _____.

If I would sign an organ donor card to indicate that I wished to donate my organs for transplantation upon my death, this person would be . . .

Pleased	1	2	3	4	5	6	7	Displeased
Interested	1	2	3	4	5	6	7	Indifferent
Upset	1	2	3	4	5	6	7	Comforted
Worried	1	2	3	4	5	6	7	Not Worried
Angry	1	2	3	4	5	6	7	Happy

This person is likely to have certain expectations about how they think you should behave. How likely is it that you would comply with this person's expectations?

Not at all Likely 1 2 3 4 5 6 7 Extremely Likely

The name of the THIRD person on my list is _____.

If I would sign an organ donor card to indicate that I wished to donate my organs for transplantation upon my death, this person would be . . .

Pleased	1	2	3	4	5	6	7	Displeased
Interested	1	2	3	4	5	6	7	Indifferent
Upset	1	2	3	4	5	6	7	Comforted
Worried	1	2	3	4	5	6	7	Not Worried
Angry	1	2	3	4	5	6	7	Happy

This person is likely to have certain expectations about how they think you should behave. How likely is it that you would comply with this person's expectations?

Not at all Likely 1 2 3 4 5 6 7 Extremely Likely

The name of the FOURTH person on my list is _____.

If I would sign an organ donor card to indicate that I wished to donate my organs for transplantation upon my death, this person would be . . .

Pleased	1	2	3	4	5	6	7	Displeased
Interested	1	2	3	4	5	6	7	Indifferent
Upset	1	2	3	4	5	6	7	Comforted
Worried	1	2	3	4	5	6	7	Not Worried
Angry	1	2	3	4	5	6	7	Happy

This person is likely to have certain expectations about how they think you should behave. How likely is it that you would comply with this person's expectations?

Not at all Likely 1 2 3 4 5 6 7 Extremely Likely

APPENDIX E: Fear Measure

Now we would like to know what you think about organ donation. Please write out any thoughts or feelings about organ donation you may have - they can be positive, negative, or neutral. List each new thought on a separate line. You do not need to fill all of the spaces - just use as many as you need.

Thoughts

1.

2.

3.

4.

5.

6.

7.

APPENDIX F: Intent Measure

Do you currently have a signed and witnessed organ donation card?

NO YES

Please respond to the following questions ONLY if you answered "NO" to the question above:

1. I intend to sign an organ donation card.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

2. I will consider the possibility of becoming an organ donor.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

3. I plan to discuss the issue of organ donation with my family members very soon.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

4. I have thought about signing an organ donor card.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

5. I would strongly consider donating the organs of a deceased family member or loved one.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

6. At some time in the future I plan to sign an organ donation card.

Strongly Disagree	1	2	3	4	5	6	7	Strongly Agree

Please circle your gender: Female Male

Please indicate your age _____

Please circle your current class standing:

Freshman Sophomore Junior Senior

If you would like an organ donor card to sign and place on the back of your drivers license, or if you just want more information about organ donation, please remove the brochure attached to this page.

Thank you for your time and participation!

Appendix G

Items comprising the individual factors used in discriminant analysis and factor reliabilities.

ALTFAC1

ALT14 - While growing up, my relationship with my parents could almost be described as hostile.

ALT23 - I am usually very cold toward my parent(s), and I try to avoid them if I can.

ALT6 - I respect my parent(s) and we have a close, warm relationship.

alpha = .83

ALTFAC2

ALT15 - I think I am a very open-minded person.

ALT17 - If I help someone else, there has to be something good in it for me.

ALT18 - I am only helpful to strangers in need when I absolutely have to be.

ALT19 - I am willing to forgive others for their mistakes.

ALT9 - I don't think people need to be very receptive to other people's ideas.

alpha = .70

ALTFAC3

ALT13 - Overall, I tend to be a cheerful person.

ALT25 - I am not what I would call a warmhearted person.

ALT4 - I am not exactly a lighthearted and happy person.

ALT7 - When people hurt me, I usually hold a grudge for a long time.

ALT8 - I am an affectionate and tender person.

alpha = .72

ALTFAC4

ALT11 - My parents always stressed to me that helping other people is one of the most important aspects of life.

ALT21 - I enjoy working for the welfare of others.

ALT22 - My family tends to do what we can to help those less fortunate than ourselves.

ALT26 - I agree with the old saying "It is better to give than to receive."

alpha = .71

ALTFAC5

ALT1 - I am generally a sincere and truthful person.

ALT10 - If I could help save somebody's life, I would do everything possible.

ALT2 - I stand up for what I believe in.

ALT5 - I enjoy doing small favors every day for the people I care about.

alpha = .71

ENDNOTES

[1] Please note that all correlations reported in this manuscript have been corrected for attenuation due to measurement error, but that significance levels were achieved prior to correction.

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