The Pennsylvania State University

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EVALUATING THE DETERMINANTS OF A SUCCESSFUL ORGAN DONOR PROCESS IN A MULTI-HOSPITAL SYSTEM

A Thesis in

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by

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ABSTRACT

The disparity between the demand for cadaveric organs and the number of available organs in the United States remains significant. This three-paper thesis assesses the interpersonal, intra-personal and organizational factors which both enhance and impede the critical pathway of the organ donor process (ODP) in a multi-hospital health system.

The first study employed exploratory factor analysis and canonical correlation to evaluate the relationships between critical care professionals' attitudes to organ donation and the organ donor process (ODP) and a set of socio-demographic/organizational factors. Findings suggest at least five meaningful dimensions of attitudes with alpha reliability statistics ranging from α=0.663 to α=0.924. These five factors explain 69% of the variance in survey responses. It was confirmed that there are measurable differences between personal attitudes concerning organ donation and attitudes related to the way the ODP is enacted. There are also significant positive relationships between attitudes and socio-demographic/organizational characteristics.

The second study used the Theory of Planned Behavior (TPB) to assess health care professionals' intentions to participate in the ODP. Results indicate that both attitudes and perceived behavioral control were significant, positive predictors of intention to participate in the ODP, with attitudes being the strongest predictor. And, while a positive relationship between subjective norms and intentions was confirmed, it was not significant. Additionally, while the Theory of Reasoned Action explained less variance in the model (64% versus 84% in the TPB), it provided a better model for the data and suggested positive, significant relationships between intention and its antecedents' attitudes and subjective norms.

The third study retrospectively explored the experiences and perceptions of critical care nurses involved in the ODP. Elaboration of the Theory of Relational Coordination (TRC) through grounded theory was achieved using interview data to delineate the nature of interpersonal relationships and communication among a loosely defined ODP team. Results confirmed that formal coordinating mechanisms by themselves are insufficient for the successful enactment of the ODP. Nurses validated the salience of communication and interpersonal relationships as suggested by the TRC, but also identified other coping strategies which make up for areas of deficit in enacting a successful ODP.

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Chapter 1

Introduction

Organ donation has emerged as the preferred method of treatment for terminal organ failure in the United States (US) and is no longer considered an experimental form of treatment. In the 20 plus years since 1984 to present the number of transplants performed in the US increased more than 300 percent (UNOS, 2004a). There have been significant advancements in organ preservation, surgical prowess, and immuno-suppression pharmacology. Medicare now provides coverage for many more types of transplant surgeries than in the past. All these factors have made transplantation a feasible, life-saving option for improving the quality and length of life for many persons with terminal diseases or organ failure.

Unfortunately for those needing transplants, the number of transplantable donor organs has not kept pace with the refinements in medical technology and transplantation techniques. The new challenge facing the organ transplantation community is meeting the challenge of the increased demand for cadaveric organs as the demand for organs significantly exceeds the current supply. As of May 17, 2006 there were 92,265 persons on the national waiting list awaiting organ transplants, and on average 17 patients die every day while awaiting an organ (UNOS, 2004a; UNOS Fact Sheet, 2003). Preliminary statistics indicate that in 2003, 6,455 persons in the United States died while waiting for a transplant. This represents a 4.3 percent increase in deaths compared to the previous year and was the highest annual increase since 1998 (UNOS, 2004b).

The number of persons who become organ donors increased by about 59 percent from 1990 to 1999, but the number of persons waiting for transplants doubled during the same time period, further exacerbating the critical shortage of transplantable organs recovered. According to several studies the reasons for the shortage include a decrease in the number of potential donors owing to seat belt and helmet laws, the need for more public education, family refusal to consent to donation, inadequate donor identification processes, ethnocultural issues and professional attitudes (Ehrle, Shafer and Nelson, 1999; Exley, White, and Martin, 2001; Minniefield, Yang and Muti, 2001; Molzahn, Starzomski, and McCormick, 2003). There is also a possibility that the increased medical success of transplantation itself has driven up the number of patients being identified as possible candidates for an organ transplant.

The types of transplantable organs have expanded from a relatively limited list to now include corneas, bone marrow, skin, endocrine glands and livers. Each cadaveric organ donor can save the lives of eight persons and restore sight, hearing or the ability to walk to several more (UNOS, 2004a). Over the past three decades numerous innovative approaches in the form of public education and state and federal legislations have been implemented to improve donor awareness among the general population and change in-hospital donation policies. These measures have been rather effective. In recent times the general public is supportive of organ donation and many want to be organ donors (Prottas, 1995).

With few exceptions, all potential donors are cared for in hospitals. This means that the hospital staff has the primary responsibility to initiate the organ donor process. Yet the potential for organ donation is not fully maximized within the hospital (Prottas, 1995; Siminoff, Arnold, and Miller 1994; Sheehy et al., 1996). In fact, earlier research by McCoy and Bell (1994) suggests that based on medical record reviews (MRR), donations are carried out on less than 20 percent of all eligible organ donors. Indicating that there are still significant, amenable shortcomings in the way organ donor processes are enacted within hospitals.

Shirley, Cutler, Heymann, and Hart (1994), posit that there are three important ways to increase the number caderveric organs: 1) increase the number of medically suitable brain dead donors through identification and referral; 2) increase the number of families that consent to organ donation; and 3) maximize the number and type of medically suitable organs recovered from eligible donors. These areas for improvement are directly impacted by the actions of the medical staff and other health care professionals who are responsible for making donation successful within their hospital.

The Department of Health and Human Services identified the shortage of transplantable organs as one of the “Nation’s most pressing public health issues” (DHHS/HRSA, 2003). In September 2003, the organ donation breakthrough collaborative released its best practices final report. The main purpose of this report was to encourage hospitals and organ procurement organizations (OPO) to generate significant increases in organ donation though rapidly identifying,

learning, adapting, replicating and celebrating “breakthrough” practices that lead to higher donation rates (DHHS/HRSA, 2003). Administrators and researchers in donation and transplantation hospitals are in the position to realize these goals by facilitating the implementation of organ donation protocols suggested by a growing body of empirical evidence.

Organ Donor Process (ODP)

Protocols were developed in health care settings as a way of standardizing relatively routine work processes (Bohmer, 1998). Subsequently, the protocols that are endorsed by various groups of health care providers have often been distilled into integrated and coordinated flow charts called critical pathways. Critical pathways are designed to outline the various tasks to be completed and decisions to be made, and the sequence in which they are to be performed by each member or group of the health care team (Bohmer, 1998).

Holmquist et al. (1999) describe the critical pathway of organ donation as a prescribed clinical pathway that utilizes a multidisciplinary approach to maximize the identification and recovery of organs Figure **1.1**. It is a summary directive on collaborative practice guidelines, donor referral practices, brain death declaration, acquisition of family consent, donor evaluation and management and the recovery of organs, which keeps all members of the organ donation team informed and involved (Holmquist et al., 1999).

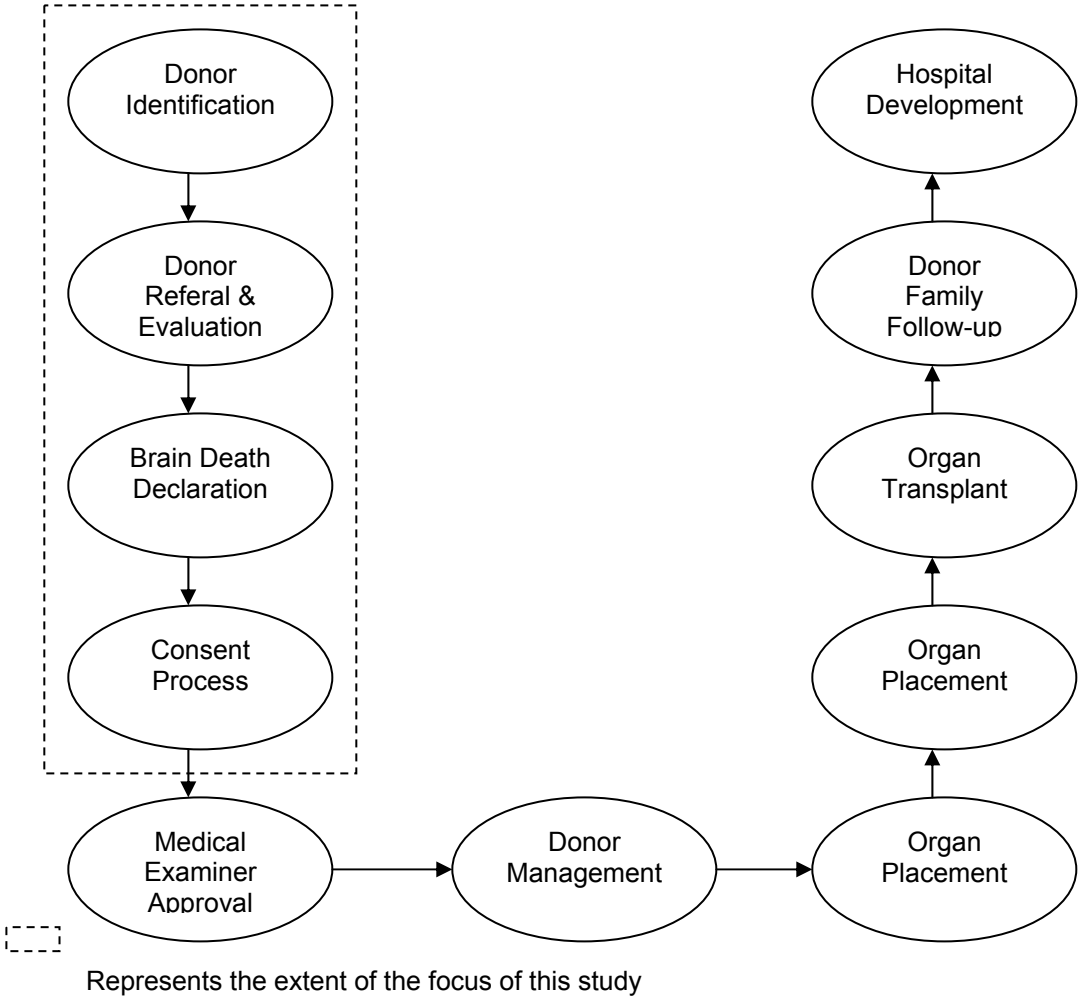

Figure **1.1**: **CRITICAL PATHWAY OF ORGAN DONATION (ADAPTED FROM UNOS 2004C)**

The first four nodes of the ODP are the focus this multi-paper dissertation project since these four nodes are functionally different from the rest of the ODP. The main responsibility of staff involved in the first four nodes of the organ donor process is to initiate and facilitate timely donor identification as well as consent to donation. The later nodes of the donor process focus more directly on organ

preservation and recovery. It is therefore reasonable to conclude that the responsibilities, dynamics and goals driving health care professionals (HCP) involved in the first four nodes of the donor process are somewhat different from those of staff involved in the latter nodes.

Donor Identification

Donor identification is usually initiated by nurses or physicians in critical care and emergency care. Successful donor identification begins with accurate knowledge about the criteria for organ donation, commitment to taking the time to involve the OPO, and knowledge of the steps necessary to initiate the donor referral process (Ehrle, Shafer and Nelson, 1999).

Referral and Donor Evaluation

Ehrle, Shafer, and Nelson (1999) suggest that potential donors are lost when health care professionals inappropriately rule out potential donors as medically unsuitable. The referral process in each hospital should be designed to allow staff to easily notify the OPO of a potential donor so that an initial medical evaluation can take place as early as possible and medical donor management can be initiated in a timely fashion.

Brain Death Declaration

A declaration of brain death is ascertained by neurologists who use a variety of medical criteria to determine whether a patient has ceased brain stem function. Because brain death results in a loss of homeostasis, it is critical to declare brain death soon after it occurs so that medical staff is able to prevent

severe cardiovascular, hormonal and metabolic changes in order to maximize the viability of organ function (Holmquist et al., 1999).

Consent

Securing consent for donation from potential donor families should be done quickly; however, enough time should be given to families to deal with their loss and spend time with their loved one (Ehrle, Shafer, and Nelson, 1999). The conversation to request consent should not take place in crowded waiting rooms, hospital hallways, nurses' station or the patient's bedside. This conversation is best conducted in a private and unrushed setting. Furthermore medical staff should not wait until the patient's prognosis becomes futile or hopeless before they begin communicating openly and frequently with families about brain death and organ donation. Research suggests that the request for donation should be decoupled from the announcement of brain death. Decoupling is defined as the separation of the request for organ donation from the announcement to the family that the patient is brain dead (Gortmaker, Beasley, and Brigham, 1996).

Study Purpose

Excellence in organ procurement and transplantation is maintained by designing donation and transplantation services with the same characteristics of infrastructure and operation as all other medical services. A successful, efficient donor-transplantation program needs adequate resources exclusively dedicated to the process, physicians and nurses who are 'experts' in different phases of

the process, and management and control of the entire organ donation process (Lopez-Navidad, and Caballero, 2001).

When a health care organization stipulates a professional standard in providing care, or specific work competencies, administrators should ensure that these become practiced standards of care. This dissertation project assesses the "organ donor process" (ODP) which is one best-practices model already in use within a large multi-hospital health system. The ODP is expected to ensure early identification and referral of potential donors, timely recognition and declaration of brain death, and the use of an optimal approach to securing family consent. This study also provides insight on the ways to take a model for successful organ donation from simply being a didactical concept and professional obligation "imposed" on staff, to a professional standard in organ donation that benefits from large-scale staff buy-in at all levels. This was done by qualitatively and quantitatively assessing the strengths and weaknesses of the relational, cognitive and environmental determinants of participation in the organ donor process (ODP) among health care professionals whose roles are functionally close to the ODP. These data shape recommendations for organizational goals and future decision-making and research.

This multi-paper dissertation consists of three papers:

1) An exploratory and descriptive paper that examines health care professionals' attitudes to various aspects of the ODP and examines the relationship between these attitudes and individual and organizational characteristics.

2) An empirical paper that elucidates the key correlates of intention to participate in the ODP among key critical care staff involved in the ODP
3) A qualitative paper that uses the experiences of health care professionals to reflect on salient issues surrounding communication and relationships that exist between key critical care staff involved in the organ donor process (ODP).

Chapter 2

Attitudes to Organ Donation among Health Care Professionals within a Multi-Hospital System: A Correlational Analysis

Previous literature is quite unequivocal on the fact that health care professionals, particularly critical care staff, serve as the primary gatekeepers to cadaveric organ recovery (Sque, Payne, and Vlachonikolis, 2000; Prottas and Batten, 1988). Several studies report that health care professionals generally support organ donation (Johnson, Miller, Kurek, Lagares-Garcia, Broznick, and Nathan, 2001; Starzomski, 1997; Molzahn 1997b; and Ettner, Youngstein, and Ames, 1988). However, clinical evidence on the current supply of recovered organs reveals that there are still several missed opportunities for donation throughout hospitals across the United States (US) each year (DHHS/HRSA 2003; Sheehy, et al., 2003; Christiansen et al., 1998).

An individuals' commitment to organ donation is influenced by their positive or negative attitude regarding donation and transplantation (Rumsey, Hurford, and Cole, 2003; Ajzen, 1991). It is tempting to think that with the slew of informational campaigns on organ donation in recent years and the hospitals' emphasis on in-services designed to improve technical competencies among medical staff, that attitudes have changed. However, Kent and Owens (1995) cautions that the attitude of health care professionals still constitutes a limiting factor in successful organ donation.

Understanding the diverse motivations, experiences and perceptions which influence attitudes to organ donation and the organ donor process is important to increasing health care professionals' participation in the organ donor process. The goal of this paper is to evaluate health care professionals' attitude to organ donation in general, as well as their attitude to specific aspects of the organ donor process. This paper also considers whether these attitudes significantly correlate with other factors.

After several years of collaborating research findings, there is only minimal practical value in simply describing the attitudes of health care professionals as negative or positive. It is more practical for researchers to delineate the mix of professional experiences, knowledge/skills, fears, beliefs, organizational and other factors that correlate with, and possibly shape health care professionals' attitudes to organ donation. The organ donation rates can be enhanced by first elucidating the areas where attitudes may most likely impact the organ donor process. We then have the opportunity to identify and subsequently modify those specific attitudes that impede the organ donor process by reinforce those attitudes that enhance it. We acknowledge that it is difficult to change the fundamental preferences or aversions health care professionals may have towards organ donation (Gross, Marguccio, and Martinoli, 2000).

Notwithstanding, the information gleaned from this type of research is actionable and can be used to develop more refined donation-related goals and targeted objectives in delivering professional education or training. The expectation that health care professionals should facilitate a patient's opportunity

and/or choice to become an organ donor is more than simply maintaining an economic balance between the supply and demand for organs. The right to be an organ donor should be respected as an integral part of the patient-provider discussions which are relevant to end-of-life issues. Hospitals with opportunities for organ donation should strive to ensure that the attitude of their health care professionals is one which accepts that every patient should be given the opportunity to become an organ donor unless they have specifically expressed a desire not to.

Chapter 3

Review of the Literature

Attitude is often treated as a one-dimensional construct in organ donation research, particularly research that examines attitudes among the health care professionals who are most closely involved in donation related activities within the hospital. This study assesses the attitudes of health care professionals involved in the organ donor process as a multi-dimensional construct. The conceptual framework guiding this study is developed from the premise that health care professionals develop a range of attitudes to various aspects of organ donation and the organ donor process itself. Many times it is difficult to look at the actual non-compliant or compliant behavior of a health care professional and determine the underlying attitudinal structure which drives it. It is also a reasonable assumption that there are other socio-demographic characteristics and organizational characteristics which correlate with these attitudes Figure 3.1. This paper posits that professional education to improve health care professionals' compliance with organizational standards in the organ donor process will be better served if a method to assess dimensions of attitudes to donation-related activities is developed and used to guide organizational interventions.

Conceptual Framework

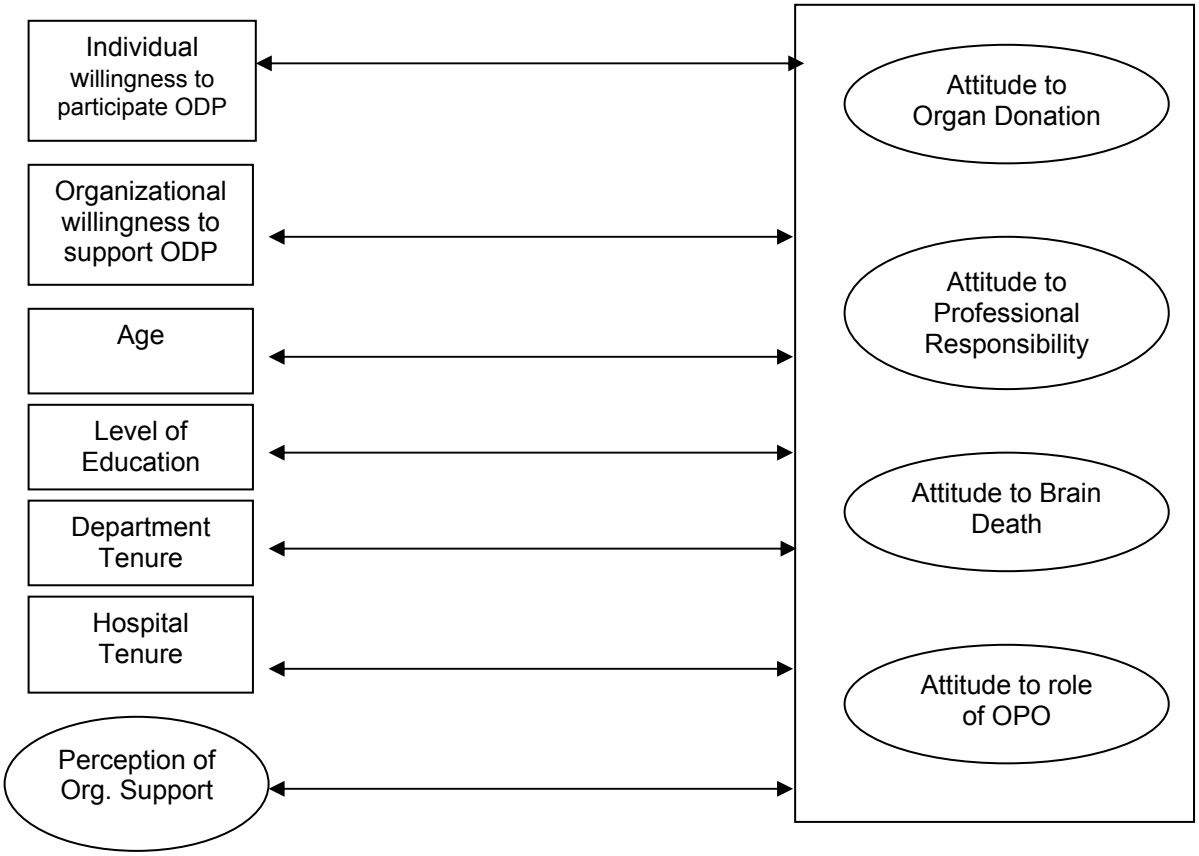

Figure **3.1**: **CONCEPTUAL FRAMEWORK OF ATTITUDES AMONG HCPS IN ORGAN DONOR ACTIVITIES**

Determinants of attitude

Health care professionals hold a variety of attitudes to a) organ donation and transplantation, b) their professional responsibilities and perceptions of professional conflict in the donor process, c) brain death declaration, d) the role of the organ procurement organization, and e) approaching families for consent. Prottas and Batten (1988) point out that a positive attitude to organ donation

among critical care staff is important to securing their personal commitment and professional involvement in the organ donor process.

Positive attitudes to the organ donor process may be the result of the high technical competence of health care professionals, confidence in knowledge about clinical criteria and protocols for organ donation, positive personal experiences with donation, and continued organizational support (Sque, Payne, and Vlachonikolis, 2000). One UNOS study found that neurosurgeons who had a good understanding of transplantation and its positive outcomes were much more involved in the organ donor process (Randall and Marwick, 1991). A second study found that among a sample of nurses, those who described themselves as '*very well informed*' and '*well informed*' about organ donation and procurement, were more positively disposed towards initiating the donor process even though it may be emotionally difficult for families (Sque, Payne, and Vlachonikolis, 2000). Additionally, Bidigare and Oermann (1991) found that medical staff with previous donor experience held more positive attitudes to donation than those without the experience.

Conversely, negative attitudes to the organ donor process may be the result of ambivalence towards the technical requirements of organ donation, lack of confidence, or unwillingness to commit to the time and emotional costs of involvement in the process. Health care professionals may have reservations about clinical aspects of the process, or they may be unwilling to face the emotional costs inherent in involvement in the donation process. The emotional costs of switching from caring for a critically ill patient to maintaining the organs

of a dead body can be psychologically draining for health care professionals. Crombie and Nicolls (1992) posit that the idea of a dead person being ventilated and surgically prepped for organ procurement can be a difficult concept even for medically trained staff to accept.

Day (2001) suggests that health care professionals may view the early referral of a critically ill patient to the OPO prior to brain death, as conflicting with their professional responsibility and dedication to treat a brain injury to the fullest. The task of approaching a grieving family to request consent for donation can also be emotionally demanding for health care professionals. Physicians and nurses may have concerns about interacting with the families of potential donors because of the fear that the family may be offended or further distraught by the request. They are often concerned that personally requesting consent to donation jeopardizes the family's trust, and may be perceived as a conflict of interest (Elliott, 2002).

Even when positive attitudes to organ donation exist, health care professionals may find it difficult to carry out their hospital's organ donation protocols because of ambiguity in hospital policies, fear of legal repercussions, poor collaboration between team members, insufficient organizational resources, or other factors (Elliott, 2002; Prottas and Batten, 1988). Kiberd and Kiberd (1992) report that nurses find it difficult to support organ donation in their hospitals when; (a) there is not enough nursing staff, (b) they receive no feedback on transplantation results, (c) donation is time consuming, and (d) there is a lack of psychological support, education and respect among medical staff. It

is also fair to speculate that less effort will be made on the part of nurses to initiate the organ donor process if the organization has not emphasized choices in donation as an important facet of the myriad of end of life issues that nurses often negotiate. If health care professionals perceive that they are deficient in the time, skills, or other resources necessary to effectively support their involvement to the organ donor process, their intention to participate in the donor process is undermined. Administrators need to be cognizant of the fact that physicians and nurses need to feel empowered within their hospitals. They should be encouraged to take the initiative to initiate the organ donor process and have their efforts applauded, not curtailed (Riley and Coolican, 1999; Prottas, 1995).

Attitudes

Attitudes to organ donation/transplantation

Organ donation is no longer considered an experimental form of treatment and has emerged as the preferred method of treatment for terminal organ failure in the United States (US). In fact, transplantation statistics indicate that, depending on the organ transplanted, transplantations are successful 70% to 95% of the time (Pendleton, 1998). Johnson, Miller, Kurek, Lagares-Garcia, Broznick, and Nathan (2001), report that 99% of a sample of trauma surgeons either '*agreed*' or '*strongly agreed*' that organ donation was an effective and acceptable method of treatment. Social psychology theory research has supported the idea that health care professionals' attitude toward organ donation

mediates intention to adhere to the organ donor process (Randall and Marwick 1991; Ajzen, 1985). Kent and Owens (1995) found that acute care nurses who were ambivalent about the effectiveness of organ donation and transplantation were less likely to get involved in donation-related activities.

Nurses are often identified as the health care professionals who have the most one-on-one contact with the family and are also in the best position to recognize a potential donor earliest (Sque, Payne and Vlachonikolis, 2000; Molzahn, 1997a; Prottas, 1995). Nurses depend on physician support as team members in the ODP. Research has suggested that younger physicians, male physicians, and physicians working in larger hospitals were more likely to be professionally involved in organ donation (Cossé and Weisenberger, 2000; Molzahn, 1997b). Therefore fostering a positive attitude to the ODP among nursing staff, and facilitating their efforts through physician support and leadership when they take the initiative in the ODP is critical to its success.

Attitude to perception of professional conflict

Negative attitudes to organ donation may also emanate from the perception that promoting organ donation creates a professional conflict for the health care professional. The ambivalent attitudes and moral quandary that is sometimes reported, may stem from the perception that an early referral of a potential organ donor to the organ procurement organization may prematurely tip the balance between a tentative commitment to organ procurement on the one hand and treatment of patient's brain injury on the other hand, in favor of organ procurement. Prottas and Batten (1988) found that most trauma surgeons did

not consider it a professional conflict to treat a critically ill patient before brain death for the purpose of maintaining their organs. Johnson et al. (2001) found that most trauma surgeons *agreed* or *strongly agreed* that it was their professional responsibility to maintain organs in order to preserve the patient's and family's right to donate.

Attitude to brain death declaration

Physicians make the brain death declaration and often provide support in organ donor cases (Prottas, 1995). They are expected to work closely with the OPO and communicate with the families about a patient's prognosis. The concept of brain death is a fairly complex one to explain and understand, and the physician should take full responsibility to communicate the occurrence of brain death to the family (Randall and Marwick, 1991).

Brain death is an important demarcation point at which a living person becomes deceased. Brian death is now widely accepted as irreversible cessation of circulatory and respiratory functions and an irreversible loss of brain function including the brain stem (Döşemeci, Yilmaz, Cengiz, Dor, and Ramazanoğlu, 2004). As late as 1993, there were still some states which did not recognize brain death as legal death. This set the stage for legal and ethical issues of major proportions (Curtin, 1993). While many hospital administrators do not consider the legal implications of brain death declaration to be a significant problem, more than 50% of neurosurgeons in a study by Prottas and Batten (1988) disagreed. The fundamental concern is that brain death makes organ procurement ethical. Cadaveric organ donation can only be successful if

all persons involved, surgeons, recipients, OPO staff, and donor families accept brain death as a marker of true death (Sharp, 2001).

Attitude regarding the role of OPO

Organ donation works best when all the health care professionals collaborate as an interdisciplinary team. As laws have changed, and organizational policies have changed, the matter of who is doing what has sometimes becomes unclear. The decision of whose responsibility it is to approach the potential donor families is often hotly contested. The concept of a designated requestor was one recommendation that was implemented in order to reduce the numbers of potential donors lost when families decline to consent. A designated requestor is a specially trained individual often dispatched by the OPO to the hospital, to discuss brain death and address questions about the option of donation with the family (DHHS HCFA, 1998). Previous research does indicate that when the donation request is made by someone who is specially trained in consenting, the consent rate is higher (Day, 2001; Stapleton, 2000).

The idea of a designated requestor has lost some favor and its actual implementation has morphed somewhat depending on the health care system. Still, some health care providers and OPO personnel still mistakenly view the Medicare regulations of the Healthcare Financing Administration (HCFA) (now known as Centers for Medicare and Medicaid – CMS) 'designated requestor' rule as meaning that only OPO staff can approach the family. Ideally however, both the OPO and hospital will jointly decide how best to approach families (Stapleton, 2000). This is supported by Klieger et al. (1994) who noted that there was a

higher likelihood of consent when both the OPO coordinator and hospital staff member were involved in making the request for donation than either individually.

Health care professionals involved in the organ donor process are interacting with families at times when they are most vulnerable to the effects of grief. The tragic circumstances that result in the best candidates for donation are often those that take families by surprise. After caring for a patient for some time, there are bonds that develop between the medical staff and the family. Both the physicians and nurses may see the OPO's role as usurping their authority and attachment to the family.

Research Questions

The purpose of this study is to assess and better delineate the attitudes of staff to specific aspects of the organ donor process and answer the following research questions:

1. ***Will the emergent dimensions of attitude be consistent with the dimensions suggested by the literature which are; attitude to donation, attitude to brain death, attitude to professional responsibility, and attitude to the organ procurement organization?***

2. ***Is there a correlation between the emergent dimensions of attitudes to organ donation, the organ donor process and organizational and individual characteristics?***

    - *What is the relationship between 'attitudes to organ donation' and organizational and individual characteristics?*

    - *What is the relationship between 'attitudes to perceptions of professional responsibility/conflict' and organizational and individual characteristics?*

    - *What is the relationship between 'attitudes to brain death' and organizational and individual characteristics?*

- *What is the relationship between 'attitudes to the organ procurement organization and organizational and individual characteristics?*

Chapter 4

Methods

Study Design

This study is an exploratory and descriptive study. It first uses exploratory factor analysis to determine whether the four dimensions of attitude to organ donation among health care professionals involved in the organ donor process, suggested by the donation-related literature, can be reasonably confirmed using survey items that were administered to a sample of health care professionals. Second, it also assesses the linear correlations between attitudes and other individual and organizational characteristics. The conceptual framework was developed using information provided by several previous studies of attitudes among health care professionals in the context of organ donation. The conceptual framework was then expanded to include individual and organizational characteristics that have been identified by previous studies as reasonable correlates of individual attitude to organ donation.

This study subsequently uses canonical correlation analysis to assess the relationships that exist between the dimensions of attitude that emerged and organizational and individual characteristics such as individual willingness to participate in ODP, organizational willingness to participate in the ODP, age, department tenure and hospital tenure. Canonical correlation was chosen because it is an analytical technique that subsumes all classical correlational

analyses such as T-tests, ANOVA, ANCOVA, and MANOVA etc. In fact, canonical correlation reflects the complexity of reality by simultaneously considering all the relationships among variables (Thompson, 1996). This is appropriate since no comprehensive theory currently exists to examine the research questions of interest.

Data Collection

The data were collected through a mail survey distributed at nine health system hospitals. Prior to distribution, departmental leaders were provided with general information on the purpose of the research project so as to garner their support for the project within their departments. Eight hundred (800) survey packets were hand-delivered to the mailrooms in each hospital for distribution to physicians, nurses, and a few select administrative staff via the hospitals' interoffice mailing systems. The confidential information packet included the survey, a cover letter of invitation with a description of the study, and an informed consent form. Participation in the study was voluntary and confidential. One or more of the following incentives were included in each packet: a coupon for 1 pint of ice cream from a local creamery, and/or 1 packet of peanuts and an ink pen with the health system's logo. Each respondent was encouraged to return their completed surveys via interoffice mail and drop-boxes. The survey was also available online via a secure website for those who preferred this method. Unique codes were required for each respondent in order to eliminate duplication or multiple entries from a single individual. Follow-up reminders were sent one week later.

The sampling frame was made up of a sub-sample of individuals who were invited to participate in a larger, multi-wave, cohort research project on organ donation in the health system. Respondents for this initial wave of data collection were selected using a stratified sampling technique. One thousand six hundred and two (1,602) potential respondents were targeted within the hospital system based on their functional proximity to the organ donor process. Of these, a selection of approximately one-half (n=800) were selected to participate stratified by hospital. These health care professionals included pharmacists, respiratory technicians, laboratory technicians, pastoral care and social work.

Instrumentation

Attitude Variables

All attitudinal items were measured on a unipolar 6-point Likert scale (1 - "Strongly disagree" to 6 - "Strongly agree"). Eight items were reverse coded for analysis. This ensured that higher numbers on the Likert scale consistently corresponded with more positive responses. Factor analysis confirmed whether or not the underlying factor structure proposed by the conceptual framework was valid. Several of the items in this survey have been used in previous descriptive studies to assess the attitudes of health care professionals without any determination of the reliability or validity of the factor structure of the items.

The three items capturing organizational support were measured on a 5-unipolar Likert scale (1 - "Never" to 5 - "Always"). An assessment of alpha reliability was also conducted just to ascertain that the factor structure identified by Prochaska (2000) held up in this population as well. Table **4.1** lists each

original item used for factor analysis in this study, the *a priori* factors/constructs, and the factor and item labels.

Attitude to organ donation

Items proposed to measure health care professionals' positive "attitudes to organ donation" were adapted from Johnson et al. (2001); Armitage, Norman and Conner (2002); Gantt (2001); Warburton, Terry, Rosenman, and Shapiro (2001); Prochaska (2000); and Sideridis, Kaissidis, and Padeliadu (1998). See Table 4.1 for instrumentation.

Attitude to professional responsibility

The items included in the factor structure to measure "attitudes to professional responsibility and professional conflict" were adapted from Johnson et al. (2001). See Table 4.1 for instrumentation.

Attitude to brain death

Items included in the factor structure for measuring "attitudes to brain death" protocol were adapted from Johnson et al. (2001); Armitage, Norman and Conner (2002); Gantt (2001); Warburton, Terry, Rosenman, and Shapiro (2001); Prochaska (2000); and Sideridis, Kaissidis, and Padeliadu (1998). See Table 4.1 for instrumentation.

Attitude to OPO involvement

Items included in the factor structure to measure "attitudes to OPO involvement" in the organ donor process were adapted from Johnson et al. (2001); and Prochaska (2000). See Table 4.1 for instrumentation.

Table **4.1**: **ITEM INSTRUMENTATION "A PRIORI"**

ITEM	AUTHOR	LABEL
Attitude to Organ Donation	Johnson et al. (2001);	FAC 1
I believe that transplantation is an effective and accepted method of treatment	Armitage, Norman & Conner (2002);	ATTDON1
I believe all families should be presented with the opportunity to donate their loved ones…	Gantt (2001);	ATTDON2
I think that participating in organ donation activities is worthwhile	Warburton, Terry, Rosenman, &	ATTDON3
I think that participating in organ donor activities …is a good thing	Shapiro (2001);	ATTDON4
I do not personally support organ donation (*item reversed*)	Prochaska (2000);	ATTDON5
The organ recovery process takes too much time and is wasteful (*item reversed*)	Sideridis, Kaissidis, & Padeliadu (1998).	ATTDON6
Attitude to Professional Responsibility	Johnson et al. (2001)	FAC 2
It is my professional responsibility to preserve a person's organs prior to brain death declaration….		PRORES1
It is my professional responsibility to maintain organ preservation…for patients awaiting transplantation		PRORES2
Caring for a terminal person prior to brain death… creates a professional conflict (*item reversed*)		PRORES3
Participation in the ODP feels like a conflict of interest (*item reversed*)		PRORES4
I am familiar with the criteria for identifying an organ donor.		PRORES5
Attitude to Brain Death	Johnson et al. (2001);	
I am comfortable with the protocol used in my institution for determining brain death	Armitage, Norman & Conner (2002);	FAC 3
I routinely pronounce patients brain dead who meet the brain death criteria	Gantt (2001);	BRAIND1
I only adhere to my hospitals brain death policy if the family wants… (*item reversed*)	Warburton, Terry, Rosenman, &	BRAIND2
There are liability and malpractice issues surrounding pronouncing patients brain dead. (*item reversed*)	Shapiro (2001);	BRAIND3
	Prochaska (2000);	BRAIND5
	Sideridis, Kaissidis, & Padeliadu (1998).	
Attitude to Involvement of the OPO	Johnson et al. (2001);	FAC 4
The OPO should be involved in assessment … prior to clinical determination of brain death	Prochaska (2000).	INVOPO1
Determining whether a patient is a donor should be done by the attending physician with the OPO (*rev*)		INVOPO2
All brain dead patients should be referred to the OPO regardless of the decision to donate		INVOPO3
I can efficiently and effectively coordinate with the OPO		INVOPO4
The OPO should be notified prior to disconnecting a severely neurologically compromised patient…		INVOPO5
Decision when to refer a potential donor should only be made by the attending physician(*item reversed*)		INVOPO6
I …interact professionally with the OPO representative in situations other than donor recovery.		INVOPO7

Socio-demographic and Organizational Variables

Perceived organizational support

"Perceived organizational support" was measured by two items. The first was an item designed to capture respondents' perception of their organizations' willingness to support the ODP. This scale was a 5-point ordinal scale (1= "*Our hospital uses the ODP as the major approach to the organ donor process less than 75% of the time and does not intend to make this the major approach in the next year*", 2= "*Currently our hospital uses the ODP as the major approach to the organ donor process less than 75% of the time but intends to a major approach in the next year*", 3= "*Our hospital uses the ODP as the major approach to the organ donor process less than 75% of the time but intends to make it the major approach and is taking steps to do so*", 4= "*Our hospital currently uses the ODP as the major approach to the organ donor process more than 75% of the time and has done so for less than a year*", 5= "*Our hospital has used the ODP as the major approach to the organ donor process more than 75% of the time and has done so for a year or longer*").

The second measure of "perception of organizational support" was a factor structure which captured organizational support for staff involvement in donation-related activities. The items included in the factor structure for measuring "perception of organizational support" were adapted from Prochaska (2000). They were measured on unipolar 5-point Likert scales (1 - "Never" to - 5 "Always"). 1) *Our hospital encourages administrators, clinicians, and staff to be personally committed to using the ODP rather than simply following protocols*; 2)

Our hospital creates an environment that motivates administrators, clinicians and staff to work collaboratively to use or initiate the ODP; and 3) *Our hospital redesigns work expectations in line with promoting the ODP*.

Individual willingness to participate in ODP

"Willingness to participate in organ donor activities" was constructed on a 5-point ordinal scale (1= "*I do not intend to participate in the ODP*", 2= *"I intend to participate in the near future*", 3= "*I intend to participate at the next opportunity*", 4= "*I have participated for 6 months of less*", and 5= "*I have participated for more than 6 months*".

Age

"Age" was constructed on an ordinal scale (1 = "under 20", 2= "21 to 29", 3= "30 to 39", and 4= "40 to 49", 5= "50 to 59", and 6 ="60 or over").

Level of education

"Level of education" was constructed on an ordinal scale (1= "High school diploma", 2= "Associate Degree", 3= "Bachelors Degree", 4= "Masters Degree", 5= "Doctorate", and 6= "Other").

Department/Unit tenure

"Department tenure" was constructed on an ordinal scale (1= "< 6 months", 2= "6 -12 months", 3= "1 to 2 years", 4= "3 to 4 years, 5= "5-9 years", 6= "10 to 14 years", 7= "15 to 24 years", and 8 = "> 25 yrs").

Hospital tenure

"Hospital tenure" was constructed on an ordinal scale (1= "< 6 months", 2= "6 -12 months", 3= "1 to 2 years", 4= "3 to 4 years, 5= "5-9 years", 6= "10 to 14

years", 7= "15 to 24 years", and 8 = "> 25 yrs").

Involvement in the ODP

Data was also collected on participants' involvement in the various functions of the ODP, namely identification and referral, coordination, critical decision-making, pre/post operative treatment, professional education/public awareness and family liaisons. This information was reported as a descriptive variable only and was not included in subsequent analysis.

Analytical plan

The sampling frame was developed using a list of health care professionals in the nine hospitals who worked in specialties and units in the hospital where they would most likely be involved in the organ donor process. Hospitals with fewer beds in the health system were sampled at higher rates than were hospitals with more beds.

Two types of analysis were utilized to identify and evaluate scales which were later used in the canonical correlational analysis. The first analysis was a exporatory factor analysis using a promax rotation in SPSS 13. This was applied to assess the underlying factor structure of 22 items thought to measure the attitudes of health care professionals. Factors that are highly correlated cannot achieve the simple structure which is suitable to an orthogonal rotation (Thompson, 2004). An oblique promax rotation was used because the factor correlation matrix indicated that attitudes to organ donation, attitudes to professional roles and attitudes to involvement in the organ donor process are moderately correlated. Sixteen of these items had been described by Johnson et

al. (2001) in a previous study of physician attitudes to donation. The remaining 6 items were contextualized from other attitudinal studies in other areas (Armitage, Norman and Conner, 2002; Gantt, 2001; Warburton, Terry, Rosenman, and Shapiro, 2001; Prochaska, 2000; and Sideridis, Kaissidis, and Padeliadu, 1998).

In total these 22 items were identified from previous donation-related literature as items which could construct useful scales within the hypothesized domains. Pett, Lackey and Sullivan (2003) suggest that in order to be retained for scale construction items should have high loadings on the target factor and low loadings on the other factors. The criteria for judging a loading as "high" varies from study to study with some researchers using cut-off points raging from as low as 0.30 to as high as 0.55 (Munro, 2001). In consideration of the exploratory nature of this study, a judgment was made that items were required to have high loadings (>= 0.55) on the target factor and low loadings on the other factors (<=0.40). Each dimension of attitude (also referred to as factors/constructs) was operationalized as the mean reported score of the items which best captured that dimension. This resulted in a factor-based score for each dimension which could range in magnitude from 1 to 6. Factor analysis permits the reduction of a fairly large number of interrelated variables in latent dimensions. This allows for achieving parsimony among variables which explain the largest amount of common variance (Hetzel, 1996).

The second analysis pursuant to scale development was an evaluation of the Chronbach's alpha reliability statistic for each scale. In this study the internal consistency of a scale is considered acceptable if the alpha statistic is greater

than 0.60. Although by some standards this may be particularly generous lower bound of scale reliability, the judgment was made that it was an appropriate consideration because this constitutes an initial exploratory scale development within this population and in this subject area. Pett, Lackey and Sullivan (2003) suggest that in relatively unexplored areas of scale development in health care research, lower-bound scale reliabilities of 0.50 may be acceptable in many cases. These attitudinal scales were treated analogous to dependent variables (DVs) in the canonical correlational analysis (CCA). However, this does not imply a causal relationship.

The alpha reliability was also assessed for the three items that were used to capture the concept of organizational support for donation, as perceived by health care professionals who work in the hospitals. These items have been developed, validated and used in several previous studies by Prochaska (2000). The alpha reliability for these items can be stipulated as acceptable since it was greater than 0.70 even in this sample. These items were used to generate a single indicator for this construct which could range in score from 1 to 5. This indicator of organizational support for staff involvement in donation was used along with the socio-demographic variables; individual willingness to participate in ODP, organizational willingness to participate in the ODP, age, department tenure and hospital tenure, as variables analogous to independent variables (IVs) in subsequent correlational analysis. However, this does not imply a causal relationship. Canonical correlation as diagrammed by Figure 3.1 was performed using the SAS/STAT® software version 8.02.

Chapter 5

Results

A total of 139 surveys were completed and returned within the eligible response time frame. The responding sample consisted of critical care staff who reported being involved in a range of responsibilities in the organ donor process. The responding sample mirrored the targeted sampling frame on the key selection variables - hospital, and job code. The surveys used for subsequent cross-sectional analysis were 85 surveys which were completed and returned via the interoffice mailing system and 44 surveys which were submitted online.

Of the respondents, 36 individuals reported being involved in identification and referral, 13 were involved in coordination activities, 2 were involved in critical decision-making, 17 were involved in pre/post operative treatment, 7 reported involvement in professional education and public awareness, and 8 were involved as family liaisons or bereavement support. Many respondents (n=40) declined to complete this item.

A demographic profile of the responding sample is presented in Table **5.1**. Most of the respondents were Caucasian (82%), females (63%) and in the nursing discipline (60%). More than 67% of respondents reported being 40 - 59 years old and members of the hospital system for 5 to 14 years (35%). The age variable was originally collected in 10 year intervals. Table 5.1 recodes and reduces this variable into 20 year increments. Similarly, the hospital tenure

variable was collected in 10 year increments. Table 5.1 recodes and reduces the hospital tenure variable with larger intervals as well.

Table **5.1**: **SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS**

Demographic Characteristics	Frequency (N=139)	Percent (%)
Gender		
Male	40	28.8
Female	88	63.3
Missing gender	11	7.9
Age		
21-39	31	22.3
40-59	94	67.6
60 and older	5	3.6
Missing age	9	6.5
Race/Ethnicity		
Hispanic/Latino	2	1.4
Asian/Pacific Islander	11	7.9
Black/African American	4	2.9
Caucasian/White	118	82.0
Missing race	4	2.9
Health care Discipline		
Nursing	84	60.4
Medicine	27	19.4
Allied Health	13	9.4
Dentistry	1	0.7
Education	1	0.7
Other	8	5.8
Missing	5	3.5
Hospital Tenure		
Less than 5 yrs	41	29.5
5 to 14 yrs	48	34.5
15 to 24 yrs	25	18.0
>= 25 yrs	15	10.8
Missing	10	7.2

(N=139)

Data preparation for analysis

Questions were coded so that higher numerical selections corresponded with more desirable answers. Eight items were reverse coded to ensure compatibility within attitudinal scales (See Table 4.1). Thirty-five (25%) respondents were missing data on at least one item related to the constructing the attitudinal scales. Twelve (9%) respondents who failed to complete items on three or more scales were completely deleted from the factor analysis and generation of factor scales, while respondents missing fewer items were deleted from the analysis. This resulted in a final sample size of 127 for subsequent analysis.

In the US health care system being personally or professionally committed to organ donation is, for the most part, considered a socially desirable attitude among health care professionals. Therefore, it is not surprising that the data was negatively skewed and platykurtic. Tabachnick and Fidell (1996) suggest a reflection followed by a log transformation in order to produce data that is closer to normality. Fortunately all the variables used in these analyses are skewed in the same direction and almost to the same extent. The transformation was $Lg10(k - x) = newX$. Where k (constant) = 8; x = scale response value from 1 to 6; and $newX$ = new scale response value.

Attitudinal Measures

Exploratory factor analysis with promax rotation was performed using SPSS 13 to estimate the number of factors present in the 22 initial attitudinal items. The Kaiser-Meyer-Olkin (KMO) statistic may vary from zero to one and is used to assess the difference between the partial correlations and zero-order correlations

of the variables (Munro, 2001). The Kaiser-Meyer-Olkin (KMO) statistic of 0.781 within this sample is acceptable for the assessment of the attitudinal constructs in this study. The first *a priori* hypothesis tested was whether there would emerge four dimensions of attitude, namely - attitude to organ donation, attitude to perception of professional responsibility, attitude to brain death and attitude to role of the OPO. However the factor analysis indicated that the items did not fall into a 4-factor structure. An assessment of the percentage of total variance explained, the scree plots and eigenvalues indicated that five attitudinal factors may be reasonably extracted from this dataset and not four as first hypothesized. Taken together these five factors explained 69 percent of the variance in the items (Table **5.2**).

Attitude to brain death did not emerge as a factor within this population as the items did not hang together well. The factor initially developed to capture respondents' attitudes to the role/involvement of OPO in donation activities seemed to be better conceptualized as two separate factors, the one which captures respondents' attitudes to professional roles and protocols related to brain death protocols and the other which captures attitudes to the collegial and collaborative relationship between the health care professionals and the OPO.

Table **5.2**: **FACTOR STRUCTURE WITH PROMAX ROTATION**

ITEM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ATTDON5	.854	--	--	--	--	--	--
ATTDON1	.823	--	--	--	--	--	--
ATTDON4	.686	--	--	--	--	--	--
ATTDON3	.663	--	--	--	--	--	--
ATTDON2	.547	--	--	--	--	.389	--
BRAIND3	.372	--	--	--	--	--	--
PRORES3	.353	--	--	--	--	--	--
PRORES2	--	.993	--	--	--	--	--
PRORES1	--	.990	--	--	--	--	--
BRAIND1	--	679	--	--	--	--	--
BRAIND4	--	--	.812	--	.371	--	--
ATTDON6	--	--	.796	--	--	--	--
PRORES4	--	--	.768	--	--	--	--
INVOPO7	--	--	--	.871	--	--	--
PRORES5	--	.403	--	.559	--	--	--
INVOPO5	--	--	--	.492	--	--	--
INVOPO1	--	--	.389	--	.918	--	--
INVOPO5	--	--	--	--	.559	--	--
INVOPO3	--	--	--	--	.553	--	--
INVOPO2	--	--	--	--	--	.799	--
INVOPO6	--	--	--	--	--	.702	--
BRAIND2	--	--	--	--	--	--	.959

-- Values less than 0.350 suppressed

The first five meaningful factors that were used in the subsequent development of the attitudinal scales are 1) positive attitude to organ donation; 2) positive attitude to the organ donor process; 3) positive attitude to collaborative relationship with OPO; 4) positive attitude to personal professional responsibility; and 5) positive attitude to roles/protocols related to brain death declaration. The inter-factor correlations indicate that the attitudinal factors are positively related to

each other and consistent with the previously reported research from which the items and constructs were derived (Table **5.3**).

Table **5.3**: **INTER-FACTOR CORRELATION MATRIX**

Component	(1) Attitude to Organ Donation	(2) Attitude to ODP	(3) Attitude to Collaboration with OPO	(4) Attitude to Professional Responsibility	(5) Attitude to Roles in Brain Death Declaration
1	1.000				
2	.371	1.000			
3	.214	.161	1.000		
4	.315	.190	.320	1.000	
5	.394	.356	.299	.387	1.000

The item pool of 22 attitudinal items was reduced to 19 items based on factor analysis. Items BRAIND3, PRORES3 and BRAIND2 were removed due to their poor factor loadings. Two additional items, INVOPO6 and INVOPO2 which formed a two-item factor were dropped. The poor alpha reliability of these items renders them unsuitable for creating a scale.

Chronbach's alpha reliability analyses were conducted for each of the five dimensions. Alphas range from 0.677 to 0.919. Each factor should capture only one concept. Due to a lack of homogeneity within individual factors one item was removed from each of two scales, further reducing the item pool to 15 items. The alpha for Factor 4 increased from 0.814 to 0.919 when item BRAIND1 - '*I am comfortable with the protocol used in my institution for determining brain death"* was excluded'. The alpha for Factor 5 increased from 0.593 to 0.740 when item INVOPO1 - '*The OPO should be involved in assessment …of the patient prior to*

clinical determination of brain death' was excluded'. As indicated the alpha coefficient for each of these scales increased considerably when these two items were excluded from their respective scales. These 15 items represented 5 factors which accounted for 69 percent of the variance within the responses. Table **5.4** presents the alpha reliability analyses of the items which hang together as indicated by factor analysis as well as their means and standard deviations.

Table **5.4**: **DESCRIPTIVE STATISTICS FOR ATTITUDINAL SCALES (N=127)**

Construct/ Variables	Means/ (S.E.)	SD	Promax Rotation Factor Loadings	Reliability scale α	Factor Label
Factor 1					
ATTDON5	5.27 (0.100)	1.12	0.861		
ATTDON1	5.39 (0.066)	0.75	0.866	0.808	Positive attitude to organ donation
ATTDON2	5.20 (0.077)	0.87	0.643		
ATTDON3	5.39 (0.056)	0.63	0.682		
ATTDON4	5.15 (0.080)	0.89	0.653		
Factor 2					
BRAIND4	3.14 (0.111)	1.24	0.848		Positive attitude to the
ATTDON6	4.02 (0.098)	1.10	0.730	0.677	organ donor process
PRORES4	3.89 (0.112)	1.24	0.634		
Factor 3					
INVOPO7	3.12 (0.154)	1.74	0.745		Positive attitude to
PRORES5	4.35 (0.120)	1.35	0.760	0.704	collaboration the organ
INVOPO4	4.52 (0.120)	1.35	0.638		procurement agency
Factor 4					
PRORES1	4.90 (0.096)	1.08	0.936	0.919	Positive attitude to
PRORES2	4.73 (0.110)	1.24	0.929		professional responsibility
Factor 5					
INVOPO5	4.64 (0.099)	1.12	0.847	0.740	Positive attitude to
INVOPO3	4.23 (0.124)	1.39	0.884		role/protocols related to brain death declaration

On the 6-point scale where 6 represents very positive attitudes and 1 represents less positive attitudes, the item means ranged from 3.12 to 5.39 indicating that on average the health care professionals sampled had attitudes to donation that ranged from slightly positive to considerably positive.

Respondents' perception of organizational support for the organ donor process was determined using three items previously validated in research. The alpha reliability of this scale was acceptable in this population (α = 0.897).

Attitudinal Factor Scales

Five attitudinal factor scales were developed using the 15 items retained from the confirmatory factor analysis. Table **5.5** presents the maximum raw score any single respondent could accumulate on a single composite scale as well as the raw scale means across the sample. Health care professionals' responses could range from 1 to 6. Because each composite scale has a varying number of items, the maximum attainable score per respondent per factor varies with the scale max representing highly positive attitudes.

Table **5.5**: **ATTITUDINAL FACTOR SCALE STATISTICS**

ATTITUDINAL FACTORS (Likert Scale: 1 - 6)	Scale Max	Scale Mean
1. Positive Attitude to Organ Donation (5 items)	30	5.2
2. Positive attitude to the organ donor process (3 items)	18	3.6
3. Positive attitude to collaboration the organ procurement agency (3 items)	18	4.0
4. Positive attitude to professional responsibility (2 items)	12	4.8
5. Positive attitude to roles/protocols related to brain death declaration (2 items)	12	4.4

Canonical Correlation

Canonical correlation with SAS software was performed using the final five attitudinal factors previously developed and a set of seven organizational and socio-demographic variables of the respondents. Higher numbers on the attitudinal scales represent more favorable attitudes to the five dimensions of attitude under investigation. Higher numbers on the organizational and socio-demographic scales also represent respondents' greater willingness to participate in the ODP, respondents' perception of greater organizational willingness to participate in the ODP, older age, higher level of education, longer department tenure, longer hospital tenure and higher perceived level of organization support for staff involvement in organ donor activities.

As previously mentioned, the transformation recommended by Tabachnick and Fidell (1996) was applied to the items used to create the attitudinal scales because most of the responses were negatively skewed and platykurtic. In order to improve the linearity of relationship between variables and the normality of their distributions for subsequent canonical correlation analysis, Tabachnick and Fidell (1996) suggest a reflection and logarithmic transformation in order to produce data that is closer to univariate normality. The transformation was $Lg10(k - x) = newX$. Where k (constant) = 8; x = scale response value from 1 to 6; and $newX$ = new scale response value. Additionally, Thompson (1984) emphasizes that canonical correlation analysis does not require that all variables be normally distributed as long as there is not a significant attenuation of the correlation matrix associated with differences in distribution. All the variables

used in these analyses are skewed in the same direction and almost to the same extent.

Five pairs of variates were generated from the analyses. The first canonical correlation was 0.669 (Adj. 0.621) representing 45% of the variance. This first canonical correlation is the only significant one in the data set *F* (35, 347.37) = 2.51, $\rho < 0.0001$. It extracts 39 percent of the variance from the attitudinal set of variables, and 21 percent of the variance from the set of socio-demographic/ organizational variables. Shown in Table **5.6** are the standardized factor correlations, the significant canonical variate, standardized canonical variate coefficient, redundancy coefficients, within-set variance (proportion of variance) and canonical correlation.

The subsequent canonical correlations were not statistically significant. The second canonical correlation: R = 0.400, F (24, 290.76) = 1.30, $\rho = 0.1612$. The third canonical correlation: R = 0.314, F (15, 232.29) = 1.05, $\rho < 0.4069$. The fourth canonical correlation: R = 0.259, F (8, 170.0) = 0.840, $\rho = 0.5728$. The fifth canonical correlation: R = 0.087, F (3, 86.0) = 0.22, $\rho = 0.8840$.

With a cut-off correlation of absolute 0.3, the first canonical variate has high loadings on individual willingness to participate in the ODP, organizational willingness to participate the OPD, and organizational support for staff involved in donation activities in the socio-demographic/organizational set. Among the attitudinal set of variables, the first canonical variate had high loadings on all five dimensions of (reflected log of) attitude. The first canonical variate indicates that health care professionals who are willing to participate in the ODP (0.79), and

who perceive that their health care organization is willing to participate in the ODP (0.65) as well as support staff who are involved in organ donation activities (0.61), they are more likely to have positive attitudes to organ donation (0.61), positive attitudes to the ODP (0.49), attitude to collaboration with OPO (0.90), positive attitudes to professional responsibility (0.50), and positive attitude to role and protocols associated with brain death declaration (0.50). This suggests that greater individual and organizational willingness to participate in the ODP as well as a perception of organizational support for staff involved in organ donation are related to more positive donation-relevant attitudes among health care professionals.

The redundancy statistics indicate that the socio-demographic/ organizational variables which have been treated analogous to independent variables are able to extract 17 percent of the variance in the attitudinal variables. This addresses the research questions which seek to delineate the ability of the socio-demographic organizational variables to explain variance among the attitudinal variables. Similarly the attitudinal variables which are treated analogous to dependent variables extract 10 percent of the variance in the socio-demographic/organizational variables.

Table **5.6**: **CANONICAL CORRELATION ESTIMATES(N=127)**

	FIRST CANONICAL VARIATE	
	Correlations	**Coefficients**
ATTITUDINAL VARIABLES		
Attitude to organ donation ⌜ (FAC 1)	0.6174	0.4068
Attitude to the ODP ⌜ (FAC 2)	0.4884	0.0881
Attitude to Collaboration with OPO ⌜ (FAC 3)	0.9008	0.7846
Attitude to Professional responsibility ⌜ (FAC 4)	0.4993	0.0814
Attitude to roles/protocols related to brain death declaration ⌜ (FAC 5)	0.5026	-0.0830
Percent Variance	0.3866	
Redundancy	0.1732	
SOCIO-DEMOGRAPHIC/ORGANIZATION VARIABLES		
Individual willingness to participate in the ODP	-0.7858	-0.7235
Organizational willingness to participate in the ODP	-0.6493	-0.1285
Age	-0.1361	-0.3382
Level of education	0.1571	0.1847
Department Tenure	-0.1351	0.0590
Hospital tenure	-0.0924	0.1932
Organizational support for staff in donation activities ⌜	-0.6138	-0.4610
Percent Variance	0.2123	
Redundancy	0.0951	
CANONICAL CORRELATION	**0.669 (R^2=45%)**	

⌜ Variables calculated using the transformation – reflection followed by logarithm.

The standardized canonical coefficients show that although demographic variables are important, it is the individual willingness to participate in the ODP as well as a perception of organizational support for staff participation in donation-

related activities that were the variables which contributed the most to the first canonical variate. The impact of increase in age is a little less definitive. Also among the attitudinal variables it is the positive attitude to donation, and positive attitude to the collaborative and collegial relationship to the OPO among health care professionals that contribute the most to the canonical relationship.[1]

[1] These findings were replicated and cross-validated in a second sample (N=123)

Chapter 6

Discussion

This study examines the linear relationships that exist between individual attitudes and individual/organizational characteristics. There were five factors that emerged from the factor analysis and not four as initially proposed. The shift in emergent factors among attitudinal items is not surprising given the fact that these items were not previously reported to be “valid” and “reliable” measures of attitudinal factors in the original studies. It is even more interesting to confirm that there are indeed differences between a health care professionals’ personal attitude to organ donation and their attitudes to the way the organ donor process is carried in their hospital. The scale mean of the “attitude to organ donation” scale was the highest (5.3) compared to the scale mean of the “attitude to the organ donor process” scale which was the lowest (3.7). This indicates that even with a high personal commitment to organ donation, a poor perception of the way organ donation is carried out in a hospital can have a dampening effect on how readily critical care staff engage in the organ donor process.

Additionally the scale mean of “attitudes to collaboration with the organ procurement agency” were also relatively low (4.1) compared to attitudes to organ donation. One would hope among a population of health care professionals who report being quite supportive of organ donation that they would also have comparably positive attitudes to both the process within their

hospital that makes organ donation possible and the organ procurement organization that facilitates successful organ donation. However, the emergent factor does not elucidate exactly which aspects of collaboration between critical care staff the organ procurement organization reduces the level of positive attitudes among the responding critical care staff. It would be premature to conclude based solely on this study whether this seeming inconsistency is as a result of an inflation of socially desirable responses to questions related to organ donation or whether there are significant negative influences on health care professionals' attitudes to the organ donor process as it is carried out in their hospitals and the organ procurement organization. These are concepts that can be teased out with further refinement of attitudinal items and replication of the research in different samples.

Several other important inferences can be drawn from the canonical correlation analysis that was conducted. First, canonical analysis highlighted and further confirmed the differences between health care professionals' "attitude to organ donation" in general, "attitude to their professional responsibilities" and "attitude to the OPO" and the "attitude roles and protocols related to brain death declaration". Among the attitudinal set of items it was "attitude to collaboration with the OPO" that both extracted the most variance from the attitudinal items as well as emerged as the weightiest variable. This highlights the need for relationships between the OPO and the health care professionals to be examined since the OPO is somewhat of a lynch pin in securing the success of any organ donation/transplantation program in any health system.

Secondly, the socio-demographic factors which previous literature has associated with differences in attitude to organ donation among health care were not evident in this sample. This may suggest that educational interventions among critical care staff most reasonably do not need to be geared to staff based on age, education or tenure. However given the distribution of the sample which was comprised primarily of older health care professionals, nurses and persons of long term tenure, there may not be enough variability in this sample to categorically rule out a possible effect.

As result of this study we can conclude that the cadre of attitudes which drive the behaviors of health care professionals in their health care environment are distinctly different from the attitudes which have traditionally been relevant to the general public. This study was able to make a distinction between attitudes to the general concept of organ donation and attitudes to the organ donor process as practiced in the health care system. The study also recognizes the high level of interdependency that must exist between health care professionals both inside and outside the hospital in organ to ensure the success and institutionalization of the organ donor process in the health care system.

Implications for Future Research

The attitudinal scores developed in this study have no parallel in earlier attitudinal research in organ donation and transplantation. The first business of future research efforts should be to further refine and validate these measures in similar populations of health care professionals. It is also possible that there are

other attitudinal dimensions important to organ donation research, that were not tapped in this study. As previously mentioned, individual attitudes are multi-dimensional and are developed though a myriad of cognitive affects to innumerable individual experiences. Health care professionals may develop attitudes based on previous experiences with organ donation and transplantation - both positive and negative. They may have religious or cultural influences on their attitudes - both positive and negative. Or they may be influenced by professional mentors both within and outside their hospital who help shape their attitudes to organ donation and transplantation. Future research should include measures of these dimensions if applicable.

Finally, it would also be beneficial to compare and contrast the attitudes of different groups of health care providers who are involved in the organ donor process at various points through the health system. The differences in professional training and responsibilities may contribute to different attitudes to organ donation and transplantation. Furthermore, this topical area of organ donation research is rather amenable to qualitative methodologies.

Implications for Policy Delivery or Practice

Donation activities within leading organ donation hospitals have traditionally focused heavily on increasing technical and clinical knowledge among health professionals involved in the ODP. The ODP is a series of interdependent work processes and a breakdown at any one of its nodes can result in the failure of the entire system. However, administrators need to be

keenly aware that these failures may not be attributable solely to a break down in the technical or clinical aspects of the system but may realistically hinge on the attitudes of health care professionals responsible for enacting each step of the process. Clinical success at each discreet node of the ODP depends heavily on the support and commitment from the various occupational subgroups involved in the entire process. These results provide the groundwork for guiding policy makers, educators and health care administrators toward the importance of assessing the attitudes of key health care professionals to the organ donor process. Future efforts can then focus on ways to tailor educational in-services to address specific attitudinal issues that most impact the organ donor process. They will then be better able to modify those attitudes that impede the organ donor process and reinforcing those attitudes that enhance it problems in addition to improving the technical and clinical competence or health care professionals.

Limitations

1. One limitation of this study was the low representation of physicians in this sample. The findings of this study would be best bolstered by replication in larger representative sample. The response rates in studies of professional beliefs, attitudes or practices among medical staff, particularly physicians, vary greatly. However, low response rates seem particularly endemic to non-compulsory research conducted among healthcare professionals. Surveys which are low in complexity or length, or those that offer monetary

compensation or honorarium, professional advancement or that carry a perception of prestige, usually report higher response rates than those that offer less valuable inducements or none at all (Mysliwiec, Brown, Klabunde, and Ransohoff, 2004; Cabana, Slish, Brown, and Clarke, 2004; Zeirler, Meissner, Cain, Strandness, 2002; Gross, Marguccio,and Martinoli, 2000; Molzahn, 1997). Groves, Presser, and Dipko (2004) found that in addition to monetary incentives, and survey complexity, other factors which influence response rates among physicians are perceived importance of the both the topic studied and entity conducting research. Any of these factors may reasonably be expected to impact the response rate achieved in this study since the inducements offered for participation were nominal.

2. The attitudinal scores generated by this study have never been previously validated in any other research and may not be generalizable to nurses and physicians outside the health system being studied.
3. Canonical correlation assumes linear relationships between variables and canonical variates. Non-linear relationships are largely unaccounted for when canonical correlation is used. There is no previous research that confirms the predominance of linear association among between the attitudinal dimensions and individual/organizational variables investigated in this study.
4. A final limitation to the generalizability of this study is the fact that it was carried out in a specific hospital system with its unique culture, strengths and shortcomings. The attitudes and experiences of health care professionals within this hospital system are not necessarily the attitudes and experiences

of health care professionals in donation/transplantation hospitals throughout the US. However, the hospitals within this health system are varied representing small, medium and large hospitals, representing high, medium and low donor potential hospitals, representing highly supportive and unsupportive units.

Chapter 7

Critical Care Staffs' Intent to Participate in Organ Donation: An Application of the Theory of Planned Behavior

Health care professionals will find that organ donation may not be a regular occurrence in their primary day-to-day functions. There are also instances where donation may be incongruent with their personal beliefs, or they may consider involvement in organ donation activities as unreasonable -- given the inordinate demands on their time or emotional energy. However, health care professionals need to be persuaded that if they do not conscientiously perform their donation-related responsibilities, organ donation would become impossible (Prottas, 1995).

In general, research has found that health care professionals working in hospitals are positively disposed to organ donation (Ettner, Youngstein and Ames, 1988; Prottas and Batten, 1989). However, this support does not necessarily translate into increases in the number of potential donors identified and referred to the organ procurement organization (OPO). Banning (1987), identifies health care professionals working in donor hospitals as the weakest link in the organ donor process. There are a variety of reasons why health care professionals may not act on their support for organ donation. Many health care professionals would probably agree that they do not necessarily lack the technical competency to anticipate which patients may potentially become donors, but it is both practically and psychologically difficult to shift focus from

treating a patient's brain injury, to maximizing the hospital's potential for organ donation (Prottas, 1995).

The Theory of Planned Behavior (TPB) posited by Ajzen (1985) is particularly appropriate for evaluating the social and cognitive factors that either encourage or impede health care professionals' intention to participate in the organ donor process. Studies that have applied the Theory of Planned Behavior in the health care context have primarily been limited to examining behaviors and behavioral intentions of patients and consumers (Burak, 1994; Giles and Cairns, 1995; Gillmore, et. al 2002; Gnatt, 2002; Okun, 2002; Randall and Gibson, 1991; Rhodes, Jones, and Courneya, 2002). Much less focus has been given to the work-related behaviors and behavioral intentions of health care professionals (Millstein, 1996). It is somewhat unclear whether the most significant reasons why health care professionals don't consistently support opportunities for donation are psychosocial, organizational or professional (Kent, 2004). There is currently a burgeoning interest in improving health care professionals' compliance with clinical pathways and adherence to protocols for standards of care in many areas of health care delivery. The organ donor process is one clinical pathway in health care delivery that has great potential for improving the lives of several critically ill persons through the death of one person. This means that there is a critical need to identify effective methods of ensuring that health care professionals consistently elect to support organ donation when opportunities arise.

The Theory of Planned Behavior can be used to predict strength of the relationship between health care professionals' intention to participate in the organ donor process and; the subjective norms in the health care environment, attitudes to donation among health care professionals, and health care professionals' self-perceived level of behavioral control over their involvement in the organ donor process. Professional education and training can be designed to modify the antecedents of behavioral intention as health care managers attempt to modify inappropriate behavior among health care professionals. The findings gleaned from this research can be used to tailor donation-related goals and objectives for delivering efficacious educational and technical information sessions.

Chapter 8

Theoretical Framework

The Theory of Planned Behavior (TPB) has provided a reliable and well-tested framework for understanding how the attitudes, subjective norms, and perceived behavioral control of rational, decision-making, individuals interact to influence their intentions and actual behavior (Figure **8.1**). Ajzen (1985) posits the best predictor of a behavior is intention to perform that behavior. Intention is in turn modified by the subjective environment in which the behavior takes place, an individual's attitude to the behavior in question, as well as an individual's self-perceived level of behavioral control over whether or not they can perform the behavior in question.

The main goal of the TPB is to predict and explain individual behavior (Ajzen, 1985) and as such it provides a parsimonious explanation of informational and motivational influences on behavior (Rhodes, Jones, and Courneya, 2002). It provides a basis for identifying where to target strategies for changing behavior. The applicability of the Theory of Planned Behavior has been established in many social and health behavior studies and the basic constructs postulated by the theory are believed to be applicable to a wide variety of behaviors (Randall and Gibson, 1991).

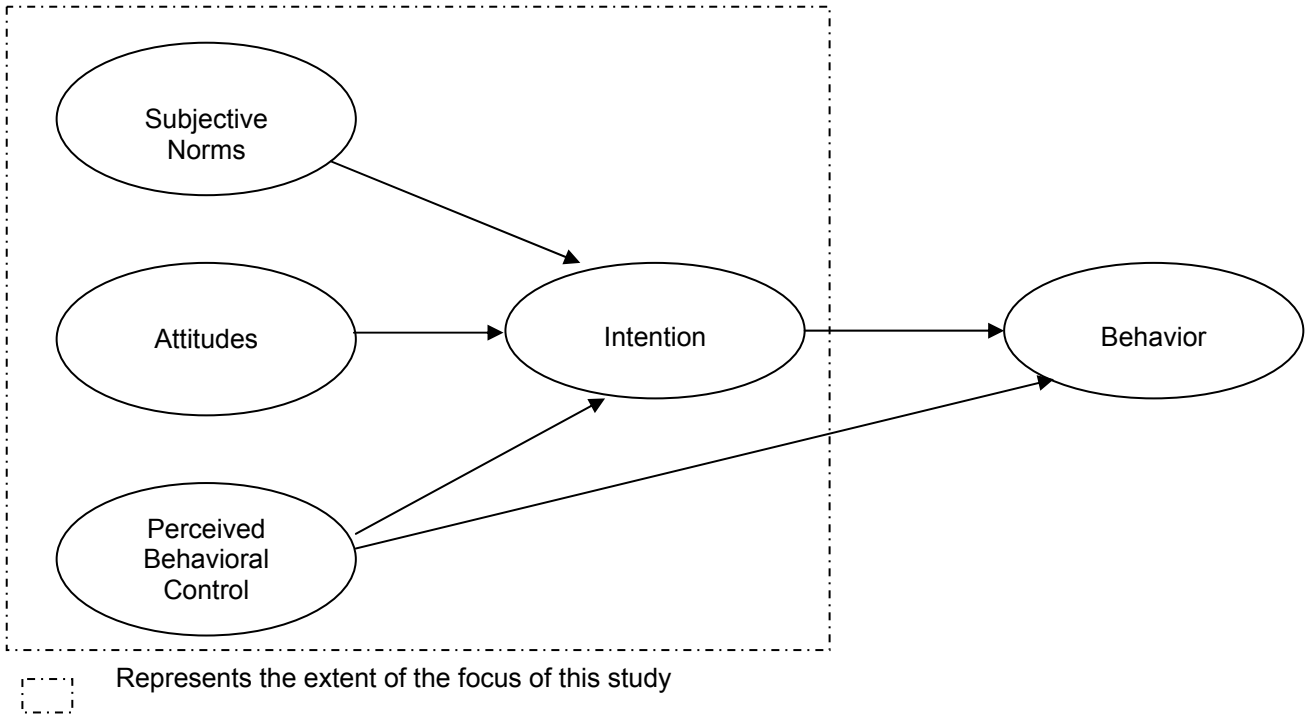

Figure **8.1**: **PATH MODEL OF THEORY OF PLANNED BEHAVIOR**

The TPB has been successfully applied in areas of research such as health-seeking behavior, smoking cessation, diet choices, volunteerism, domestic violence, weight loss, condom use, ethical behavior, breast-feeding, HIV/AIDS education, blood donation and exercise (Burak, 1994; Giles and Cairns, 1995; Gillmore, 2002; Gnatt, 2002; Okun, 2002; Randall and Gibson, 1991; Rhodes, 2002).

Nonetheless, a review of the literature available through ProQuest and Academic Ideal for the years 1993 through 2003 reveals only one study in which the Theory of Planned Behavior was used to assess staff adherence to espoused

professional standards in the organ donation and transplantation context. This study was the first phase of a three-part investigation that was conducted in the United Kingdom (UK) from 1995 to 1998 by Kent (2002). It focused on nurses' willingness to participate in the donor identification and consent process. The study assessed the factors that were most significant in determining when registered nurses, who worked in two health regions of the UK, engaged in or disengaged from donation-related behavior (Kent, 2002).

By extrapolation, Ajzen (1991) would propose that the extent to which persons actively fulfill their roles and responsibilities in the organ donor processes within their hospitals can be predicted from both their *intention* to do so and the extent to which they perceive that their ability to fulfill these roles is under their own volition or *behavioral control*. Intention to participate in organ donor processes is in turn positively modified by an individual's *subjective norms* (social pressure), *attitude*, and *perceived behavioral control* (PBC). Generally, there is a positive relationship between these three determinants and intention to perform any behavior (Bansal and Taylor, 2002). However, the relative weight of these three predictors of intention is expected to vary across behaviors and across populations being studied, and dependant on the conditions under which the behavior is being performed (Reinecke, Schmidt, and Ajzen, 1996). In fact, it may be found that when studying certain behaviors only attitude has a significant impact on intention; in others it may be attitude and perceived behavioral control that significantly impact intention; and in still others attitude, perceived behavioral

control and subjective norms may all be significant, independent predictors (Reinecke, Schmidt, and Ajzen, 1996).

Chapter 9

Review of the Literature

The Theory of Planned Behavior (TPB) has provided one of the better known contributions to the field of attitude measurement and prediction of behavior. The TPB was formulated as an updated version of Ajzen's theory of Reasoned Action (TRA). The Theory of Reasoned Action does not account for the idea that some behaviors, for example weight loss and condom use, are not completely volitional (Reinecke, Schmidt, and Ajzen, 1996). Including a measure of individual control over whether he/she engages in a particular behavior is a salient modification provided in the Theory of Planned Behavior. This study posits that the TPB is the better theory for this examination of health care professionals' intentions since participation in the ODP is not completely under their control within the health care system. Armitage and Conner's (2001) meta-analysis of 66 studies, found that inclusion of perceived behavioral control provides on average a modest 2 percent incremental increase in the variance explained when the model of TPB is compared to TRA.

The positive relationships between the constructs of the TPB have been well-supported. The magnitude and strengths of these relationships vary widely across studies depending on the population of interest and behaviors that were examined. We consider these model relationships below.

Antecedents of Behavior

Perceived Behavioral Control-Behavior relationship

Madden, Ellen, and Ajzen (1992) analyzed 10 behaviors that had different mean levels of perceived behavioral control. They found that for behaviors that were perceived by respondents as easy to perform (e.g. 'listening to an album'), the Theory of Planned Behavior performed just as well as the theory of reasoned action with an $R^2 = 0.23$. On the other hand, when they compared behaviors that respondents perceived as less under their own control (e.g. 'getting a good night's sleep'), then perceived behavioral control contributed substantial additional variance after controlling for intention ($R^2 = 0.13$ for the theory of reasoned action compared to $R^2 = 0.41$, for the Theory of Planned Behavior). Ajzen and Madden (1986), also hypothesized that the extent to which perceived behavioral control directly affects behavior depends first on the fact that the behavior being predicted must not be under complete volitional control. Second, perceptions of behavioral control must reflect actual control over the behavior with some degree of accuracy. When this is not the case, the measure of perceived behavioral control can add little to the prediction of behavior. The implication for research is that when an individual's perceptions of control are accurate, perceived behavioral control should be a good predictor of behavioral intention. However, when perceptions of control do not reflect actual control, the ability of perceived behavioral control to predict behavioral intention and subsequent behavior fails.

Applying the TPB to examine health care professionals' intention to participate in the organ donor process is most likely an appropriate consideration because health care professionals' participation in the organ donor process is not completely volitional. Health care professionals are federally mandated to refer to the organ procurement organization (OPO) all patients who meet the standard potential donor criteria. The organ donor process stipulates that this referral be made regardless of personal position on the issue of organ donation. Additionally, health care professionals need organizational support and organizational resources in order to facilitate their involvement in any in-hospital, donor-related, activity.

Intention-Behavior relationship

Several cognition-behavior models have identified intention as the most immediate and important cognitive antecedent of behavior (Abraham, Sheeran, and Johnston, 1998). Intention refers to a person's resolution to achieve a future goal or perform a future behavior (Sutton, 1998). Ajzen (1991) and Sheppard, Hartwick, and Warshaw (1988) conducted independent meta-analytic reviews of the relationship between intention and behavior. Results from these analyses indicate that the average relationship between intention and behavior was 0.51, and 0.53, respectively. The relationship between intention and behavior is expected to be strong when both constructs are measured at the same level of specificity with regards to behavior, target, context and time frame and when the time interval between measuring intention and future behavior is such that intentions have not changed (Conner and Armitage, 1998).

The intention-behavior relationship has proven applicable to a wide range of health-related behaviors and job-related behaviors. Therefore it is expected that this relationship can reasonably be extended into the domain of organ donation, specifically predicting health care professionals' intention to participate in the organ donor process in their hospital. This study recognizes the limitations of concurrently measuring behavior and intention in a cross sectional-study. Of particular concern is the possibility that measures of behavior that are contemporaneous with measures of intention may only be regarded as an assessment of past behavior and not future behavior. This study does not assess past or future behavior at this time but seeks instead to examine which proximal determinants of intention to participate in the organ donor process are the best predictors of intention when applied to this unique population of heath care providers.

Antecedents of Intention

Subjective Norms

The first determinant of intention is subjective norms. Subjective norms are the social pressures that more often than not, shape an individual's evaluation of a behavior. Subjective normative beliefs are those things a person feels they ought to do based on their personal values and the values of those persons who are important to them (Rhodes, Jones, and Courneya, 2002). For example, one study by James, Tripp, Parcel, Sweeney, and Gritz (2002) examined preschool teachers' sun-protective practices towards their students. They found that

among preschool teachers, a good predictor of their intention to use sunscreen on their students was the perceived importance of this practice to parents and other teachers.

Intention to engage in healthy dietary choices, and sun protection were positively and significantly determined by subjective norms (James, Tripp, Parcel, Sweeney, and Gritz, 2002). In contrast, areas such as intention to switch mortgage providers, and physician intention to use telemedicine (Bansal, and Taylor, 2002; Chau and Jen-Hwa Hu, 2001; van de Geer, and Kangis 2002) showed a smaller much less significant association. One explanation for this is posited by Trafimow and Findlay (1996) who suggest that based on their analysis of 30 behaviors, there was a distinction between individuals whose behavior is driven primarily by attitudes and those whose actions are driven primarily by subjective norms. A meta-analysis of the TPB by Armitage and Conner (2001) concludes that current research is equivocal on the strength of association between subjective norms and intention. Their overall assessment is that subjective norm is the TPB component most weakly related to intentions. They found that subjective norms accounted for an average of 12% of the variance of intention across 137 studies. Some researchers have even chosen to exclude this construct from their analyses. Trafimow and Finlay (1996) argue that this weakness stems from the fact that only a small number of persons engage in behaviors that are primarily driven by social pressure.

It is important to note that the predictive strength of subjective norms is a function of individual's beliefs about whether significant others think he or she

should engage or not engage in a particular behavior, weighted by the individual's motivation to comply with significant others' opinions (Ajzen, 1991). Health care professionals may often consider whether peers from salient referent groups within and outside the health care system will approve or disapprove of their behavior, when deciding whether or not to participate in the organ donor process. If the social acceptability of participating in the organ donor process outweighs that of engaging in alternative behavior, then health care professionals are more likely to actively support the organ donor process. This would be in keeping with the subjective norms that influence their professional framework (Shapiro and Watson, 2000).

Attitude

A second determinant of intention is attitude. Attitude is conceptualized as the degree to which an individual has a favorable or unfavorable appraisal of the behavior being examined. This is based on his/her perception of the desirable or undesirable consequences associated with the behavior (Ajzen, 1991). In the area of personal health behaviors, one study by Masalu and Astrøm (2003), found that attitude was a significant predictor of students' intention to restrict their sugar intake. On the other hand two other studies found that in the area of provision of health care services, among nurses who cared for persons with HIV/AIDS and nurses who conducted pain assessment, attitude was not a significant predictor of their intention to provide patient care (Dilorio, 1997; Nash, Edwards, and Nebauer, 1993). An analysis of 115 studies by Armitage and Conner (2001) found that on average attitude explained 24% of the variance in

models of planned behavior. Research continues to provide evidence for a strong relationship between attitudes and behavior, and strong attitudes are expected to be fairly resistant to change over time (Ajzen 2001).

In the context of organ donation, a health care professional's attitude refers to his/her overall positive or negative evaluative affect about fulfilling his/her role in the organ donor process (Chau, and Hu, 2001; Conner, Kirk, Cade and Barrett, 2003). Research has consistently supported the idea that the personal attitudes of health care professionals toward organ donation can either support organ donation initiatives or adversely affect the donor process (Randall and Marwick 1991). If health care professionals hold positive attitudes to the organ donor process, and associate their participation in the organ donor process with positive outcomes, they are more likely to consistently fulfill their donation-related responsibilities. In contrast, health care professionals with negative attitudes to the organ donor process are less likely to invest the emotional costs involved in participating. That is, if the negative attitudes outweigh positive attitudes to the organ donor process, behavioral commitment to the organ donor process is highly unlikely (Kent and Owens 1995; Rumsey, Hurford, and Cole 2003).

It is a challenge to tease out the differences between a health care professionals personal attitude to organ donation as opposed to his/her attitude to the organ donor process. In spite of this difficulty it is highly informative to begin to understand the attitudinal barriers to donation among health care professionals. Current research would benefit from an exploration of the mix of personal experiences, knowledge, fears, socio-cultural beliefs, demographics,

and other factors that shape health care professionals' attitudes to the organ donor process. We can then attempt to reshape these attitudes as necessary through education and hands-on experience.

Perceived Behavioral Control

The third determinant of intention is perceived behavioral control. Perceived behavioral control is a measure of an individual's perception of how difficult it is to perform the behavior in question (Rhodes, Lee, and Corneya, 2002; Shapiro and Watson, 2000). Perceived behavioral control reflects an individual's assessment of the external factors which exert both a direct effect on behavior as well as an indirect effect mediated through intentions (Ajzen, 1991). These factors may be internal to the individual and include such things as skills, abilities, emotions and power of will. Or they may be external to the individual and include such things as time, opportunity and dependence on others (Sparks, Guthrie and Shepherd, 1997).

Ajzen and Madden (1986) suggest all behaviors should be considered as falling somewhere along a continuum ranging from volitional to non-volitional behavior (Beale and Manstead, 1991). Most behavior is to a greater or lesser extent affected by non-volitional factors. Perceived behavioral control becomes more positively and significantly related to intention and behavior as volitional control over a behavior decreases, all other things being equal (Ajzen, 1991). The proposed relationship between perceived behavioral control and intention is a valid one because a person is unlikely to intend to perform a behavior that is outside his/her control. Conversely, a person is more likely to intend to perform a

behavior when she believes she has the ability and resources to perform it (Sheeran, Trafimow and Armitage, 2003).

Perceived behavioral control has been found to be the weakest predictor of intention in many behavioral studies. In several other studies, perceived behavioral control has been found to be quite good at explaining intention in the context of personal health-related behaviors (Godin and Kok, 1996). For example, studies on volunteer enrollment by college students, condom use by adolescents, and patient education on STD-HIV transmission by physicians showed a significant positive relationship between perceived behavioral control and intentions (Millstein, 1996; Okun and Sloane, 2002; Reinecke, Schmidt and Ajzen, 1996). Perceived behavioral control may exhibit a weak relationship with behavior because people are generally not very accurate at judging how much control they actually have over performing a behavior. The construct of perceived behavioral control may in fact be a multi dimensional construct depending on the behavior under investigation.

Adherence to the ODP is a professional standard within most hospital environments and conforming is expected of all health care professionals regardless of their personal position on organ donation or the organ donor process (Molzahn, Starzomski and McCormick, 2003; Holmquist, et al., 1999). On August 21, 1998 a revised set of federally mandated rules went into effect for governing donor referrals to the organ procurement organization (OPO) in hospitals that receive Medicare funding. According to the Department of Health and Human Services Federal Register (1998), the Medicare Conditions of

Participation (COP) requires hospitals to meet several requirements which include:

- Timely referral of all deaths and imminent deaths to their contracted OPO;
- Allowing OPOs or their designates to determine donor suitability;
- Ensuring that the option to donate is offered to families of all potential donors;
- Standing agreements with at least one tissue and eye bank;
- Maintenance of organ transplant-related records and performance evaluation.

Participation in the organ donor process therefore is not completely volitional due to the fact that health care professionals need training, organizational support and resources in order to facilitate their participation in donation-related activities, regardless of the strength of their intention to participate.

Research Questions and Hypotheses

This study uses empirical methods to determine the extent to which intention to participate in the organ donor process is jointly determined by health care professionals': (1) attitude toward participating in the organ donor process; (2) perception of the opinion of peers from salient reference groups regarding participation in the organ donor process; and (3) perception of the availability of resources, opportunities and skill sets necessary for participating in the organ donor process. Based on the hypothesized model (Figure **9.1**) the following research questions are posed and their respective hypotheses are tested:

- ***Are subjective norms as perceived by health care professionals, significant predictors of their intention to participation in the organ donation process?***
    - H1: Health care professionals are more likely to express intention to participate in the organ donor process when there is a perception of social pressure among their professional peers for their participation in the process, compared to a perceived lack of social pressure.
- ***Do health care professionals' attitude toward organ donation and organ donor activities significantly predict their intention to participate in the organ donation process?***
    - H2: Health care professionals with positive attitudes to the organ donor process are more likely to express intentions to participate in the ODP compared to health care professionals who express less positive attitudes.
- ***How important is perceived behavioral control in predicting staff intention to participate in the organ donor process?***
    - H3: Health care professionals are more likely to express intention to participate in the organ donor process if they perceive that they possess a high level of personal control over their participation in the process compared to a perceived low level of personal control over their participation.

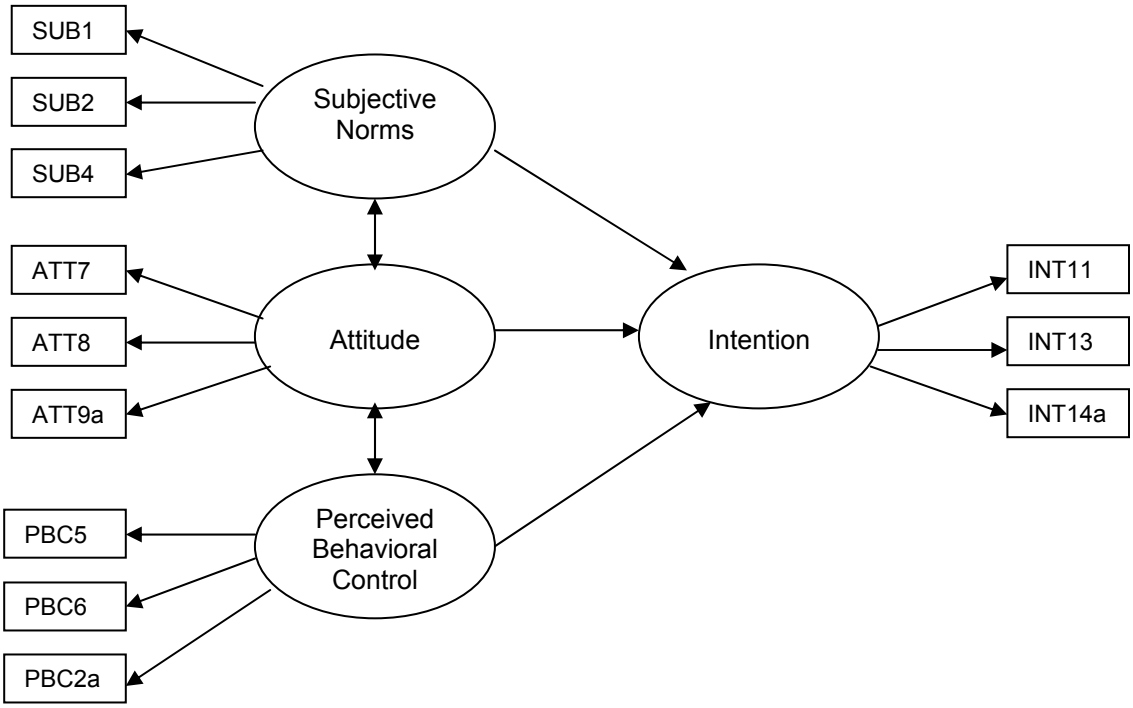

Figure **9.1**: **TPB MEASUREMENT MODEL**

Chapter 10

Methods

Study Design

This is a cross-sectional analysis that retrospectively assesses the Theory of Planned Behavior in the context of organ donation in a multi-hospital health system. The data was collected through a survey that adapted TPB items validated and used in previous studies. The criterion and content validity of the items used are well-supported by previous research (Armitage and Conner, 2001; Godin and Kok, 1996). Prior to survey distribution a small sample of 5 individuals representing the functional groups of interest (nurses, physicians) was recruited to participate in a cognitive interviewing exercise. This technique was used to further evaluate the face validity and content validity of the items among the health care professionals it was designed to assess. Changes were made to the language of the questionnaire following the cognitive interviews.

Data Collection

The data was collected through a mail survey. Prior to distribution, departmental leaders were provided with general information on the purpose of the research project in order to garner their support for the project within their departments. The survey packets were then hand-delivered to the mailrooms in each hospital for distribution to nurses, physicians, and residents, as well as some pharmacists, respiratory technicians, laboratory technicians, pastoral care, social work and persons in administrative positions staff via the hospitals'

interoffice mailing systems whose clinical responsibilities make them most likely to be involved in the organ donor process at various levels. The confidential information packet included the survey, a cover letter of invitation with a description of the study, and an informed consent form. Participation in the project was voluntary and confidential. One or more of the following incentives were included in each packet: a coupon for 1 pint of ice cream from a local creamery, and/or 1 packet of peanuts and an ink pen with the health system's logo. Each respondent was encouraged to return their completed surveys via interoffice mail and drop-boxes. The survey was also available online via a secure website for those who preferred this method. Unique codes were required for each respondent in order to eliminate duplication or multiple entries from a single individual. Follow-up reminders were sent one week later.

Instrumentation

Items were recoded on a unipolar 5-point Likert scale (1 - "Strongly agree" to 5 - "Strongly disagree"). The size of the data set made it viable to use a 5-point Likert scale. Some items were reverse coded for analysis. This ensured that higher numbers on the Likert scale consistently corresponded with more positive responses.

Many previous studies that applied the TPB do not include a detailed description of the items used in their instrument. Table **10.1** lists each item used in this survey, the corresponding latent construct, and the factor and item labels.

"Intention" was measured by three items adapted from Armitage, Norman and Conner (2002); Gantt (2001); Sideridis, Kaissidis, and Padeliadu (1998); and

Warburton, Terry, Rosenman and Shapiro (2001): 1) *I will participate in organ donor activities*; 2*) I intend to participate in organ donor activities if I am offered the opportunity*; and 3) *I do not intend to participate in organ donor activities*. Armitage et al. (2002) report the Chronbach's alpha for the intention scale as α = 0.92. Other studies have reported alpha coefficients for behavioral intention that have ranged from 0.82 to 0.92 across different types of behaviors (Sheeran, Trafimow and Armitage, 2003; Okun and Sloane, 2002; Meyer, 2002; DiIorio, 1997; Armitage and Conner, 1999; Sparks, Guthrie and Shepherd, 1997).

"Subjective norms" were measured by three items adapted from Armitage et al. (2002); Gantt (2001); Sideridis, et.al. (1998); and Warburton et al (2001): 1) *My professional organization would want me to participate in organ donor activities*; 2) *Other members of my professional organization would definitely participate in organ donor activities; and 3) I believe in following our hospital's organ donor policies.* Armitage et al. (2002) report the Chronbach's alpha for the subjective norms scale as α = 0.79. Other studies have reported alpha coefficients for subjective norms that have ranged from 0.58 to 0.92 across different types of behaviors (Okun and Sloane, 2002; Meyer, 2002; DiIorio, 1997; Armitage and Conner, 1999; Sparks, et al., 1997).

"Attitude" was measured by three items adapted from Armitage, et al. (2002); Gantt (2001); Sideridis et.al (1998); and Warburton et al (2001): 1) *I think that participating in organ donor activities is worthwhile;* 2) *I think that participating in organ donor activities in order to improve organ donation rates is a good thing; and 3*) *I do not personally support organ donation.* Armitage et al. (2002) report

the Chronbach's alpha for the attitude scale as α = 0.68. Other studies have reported alpha coefficients for attitudes that have ranged from 0.58 to 0.93 across a range of behaviors (Okun and Sloane, 2002; Meyer, 2002; DiIorio, 1997; Armitage and Conner, 1999; Sparks et al., 1997).

"Perceived behavioral control" was measured by three items adapted from Armitage et al. (2002); Gantt (2001); Sideridis, et.al (1998); and Warburton et al (2001): 1) *I could easily participate in organ donor activities if I wanted to*; 2) *I feel like I control whether or not I participate in organ donation activities*; 3) *I feel pressure to go along with the organ donor activities*. Armitage et al. (2002) report the Chronbach's alpha for the perceived behavioral control scale as α = 0.74. Other studies have reported alpha coefficients for perceived behavioral control that have ranged from 0.58 to 0.93 across a range of behaviors (Okun and Sloane, 2002; Meyer, 2002; DiIorio, 1997; Armitage and Conner, 1999; Sparks, Guthrie and Shepherd, 1997).

Analytical Plan

The final sample consisted of two independent samples which were both identified using a complex sample design. In the first sample health care professionals were first stratified either to a primary or secondary group. Health care professional who were assigned to units occupations of specialties in the hospital who would be most likely involved in the organ donor process – comprised the primary group. Health care professionals who were less likely to have direct involvement in the organ donor process and would only contribute tangentially to its enactment – comprised the secondary group. Health care

professionals were then clustered by hospital. There are nine hospitals within the hospital system. Finally, both primary and secondary groups in smaller hospitals in the health system were over-sampled in order to maintain the representativeness of health care professionals throughout the health system

A critical look at the performance of first sample revealed that the purposes of this research would be better served by further restricting eligible respondents to those health care professional who could be exclusively in the primary group. A second supplemental sample was selected consisting only of health care professionals who were assigned to units occupations of specialties in the hospital who would be most likely involved in the organ donor process. These individuals were exclusively in the primary group and analogous to the primary group in the first sample. However, only health care professionals who did *not* respond to the first survey were eligible for selection the second time. This second sample of health care professionals was also clustered by hospital and over-sampled in order to reflect each hospital's relative size within the hospital system. Both samples were considered as a single sample for analysis.

Structural equation modeling (SEM) with LISREL 8.7 software was used to test the factorial structure of the TPB constructs as well as the strength of the relationships between health care professionals' intention to participate in the organ donor process and its three antecedents--attitude, perceived behavioral control and subjective norms. Both the TPB model and its predecessor the TRA model were evaluated. Scale reliability analyses confirmed the underlying structure of the survey items and the unique latent constructs they measured.

Table **10.1**: **TPB ITEM INSTRUMENTATION**

ITEM	AUTHOR	LABEL
Subjective Norms	Armitage, Norman & Conner (2002)	SUB
My professional organization would want me to participate in organ donor activities…	Gantt (2001)	SUB1
Members of my professional organization would definitely participate in organ donor activities	Sideridis, Kaissidis, & Padeliadu (1998)	SUB2
I believe in following our hospital's organ donor activities	Warburton, Terry, Rosenman & Shapiro (2001)	SUB4
Attitude	Armitage, Norman & Conner (2002)	ATT
I think that participating in organ donor activities is worthwhile	Gantt (2001)	ATT7
I think that participating in organ donor activities … is a good thing	Sideridis, Kaissidis, & Padeliadu (1998)	ATT8
I do not personally support organ donation (*item reversed*)	Warburton, Terry, Rosenman & Shapiro (2001)	ATT9a
Perceived Behavioral Control	Armitage, Norman & Conner (2002)	PBC
I could easily participate in organ donation activities if I wanted to	Gantt (2001)	PBC5
I feel like I control whether I participate in organ donation activities	Sideridis, Kaissidis, & Padeliadu (1998)	PBC6
I feel pressure to go along with the organ donor initiative (*item reversed*)	Warburton, Terry, Rosenman & Shapiro (2001)	PBC2a
Intention	Armitage, Norman & Conner (2002)	INT
I will participate in organ donor activities	Gantt (2001)	INT11
I intend to participate in organ donor activities if I'm offered the opportunity	Sideridis, Kaissidis, & Padeliadu (1998)	INT13
I do not intend to participate in organ activities (*item reversed*)	Warburton, Terry, Rosenman & Shapiro (2001)	INT14a

Chapter 11

Results

Socio-demographic Characteristics of Respondents

A total of 325 surveys out of 2700 were completed and returned within the eligible response time frame. The final sample consisted of 287 critical care staff who reported being involved in a range of responsibilities in the organ donor process. There were 242 surveys completed and returned via the interoffice mailing system and 45 surveys were submitted online. The responding sample mirrored the targeted sampling frame on the key selection variables - hospital, and job code. Table **11.1** compares the representative proportions of these key variables in the targeted sample compared to the responding sample.

Table **11.1**: **RESPONSE RATE ANALYSIS: COMPARING PROPORTIONS ON KEY VARIABLES**

		Sample (%)	**Paper 2** (%)
GROUP	Primary	64.8	80.8
	Secondary	35.2	19.2
HOSPITAL	Hospital 1	18.2	24.9
	Hospital 2	9.5	6.3
	Hospital 3	14.4	14.2
	Hospital 4	12.9	13.9
	Hospital 5	9.0	6.9
	Hospital 6	10.8	13.6
	Hospital 7	3.6	4.1
	Hospital 8	10.9	9.8
	Hospital 9	10.7	6.3
JOB TITLE	Nurse	59.9	62.9
	Physician	2.1	1.9
	Respiratory Tech	6.1	6.9
	Pharmacy	2.4	1.6
	Social Services	2.7	2.8
	Administration	1.5	3.4

Of the final respondents, 39 individuals reported being involved in identification and referral, 12 were involved in coordination activities, 5 were involved in critical decision-making, 25 were involved in pre/post operative treatment, 6 reported involvement in professional education and public awareness, and 13 were involved as family liaisons or bereavement support. Respondents were not precluded from identifying their involvement in more than one area of the organ donor process. Several respondents (n=20) declined to complete this item. The sample consisted mostly of Caucasian, females, mostly nurses and mostly persons between the ages of 40 to 59.

Table **11.2** summarizes the demographic characteristics of the responding sample. The age variable was originally collected in 10 year intervals. Table 11.2 reflects this variable as being recoded into 20 year increments. Similarly, the hospital tenure variable was collected in 10 year increments. Table 11.2 presents the hospital tenure variable as also recoded with broader tenure.

Table **11.2**: **SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (N=287)**

Demographic Characteristics	Frequency (N=287)	Percent (%)
Gender		
Male	76	26.5
Female	204	71.1
Missing gender	7	2.4
Age		
21-39	74	26.2
40-59	196	68.3
60 and older	12	4.3
Missing age	5	1.7
Race/Ethnicity		
Hispanic/Latino	4	1.4
Asian/Pacific Islander	20	7.0
Black/African American	5	1.7
Caucasian/White	256	89.2
Other	1	0.3
Missing race	1	0.3
Health care Discipline**		
Nursing	185	64.5
Medicine	46	16.0
Allied Health	37	12.9
Social work	5	1.7
Education	3	1.0
Dentist	2	0.3
Other	15	5.2
**Multiple options may be selected		
Hospital Tenure		
Less than 5 yrs	85	29.6
5 to 14 yrs	94	32.8
15 to 24 yrs	63	22.0
>= 25 yrs	40	13.9
Missing	5	1.7

Data preparation for analysis

Survey questions were structured and coded so that the higher numerical

selections corresponded with more desirable attitudes. Three items were reverse coded to ensure compatibility with the scales. The TPB latent constructs were measured with three indicator variables each. Thirty-eight (11.7%) respondents were missing data on at least one item related to the TPB scales. The decision was made to remove these respondents from the SEM analysis since an examination of the descriptive univariate statistics of those respondents with missing variables revealed that the data was missing at random and respondents were not similar in any systematic measurable way. This is to say that the presence or absence of a value on any of the measured variables is unrelated to the respondents' status on that variable. Byrne (2001) describes this as data that is missing at random (MAR).

In the US health care system being personally or professionally committed to organ donation is, for the most part, considered a socially desirable attitude among health care professionals. Therefore, it is not surprising that the data was negatively skewed and platykurtic. Tabachnick and Fidell (1996) suggest a reflection followed by a log transformation in order to produce data that is closer to normality. Fortunately all the variables used in these analyses are skewed in the same direction and almost to the same extent. The transformation was $Lg10(k - x) = newX$. Where k (constant) = 7; x = scale response value from 1 to 5; and $newX$ = new scale response value.

Assessment of Measurement Model

The first step in determining the usefulness of the TPB model proposed by

Ajzen (1985) was to demonstrate that the model would fit appropriately in this sample of health care professionals. The model was specified in keeping with the original model developed by Ajzen but contextualized to measure behavioral intention to participate in the organ donor process and its antecedents. Factor loadings, reliability analyses, and inter-item correlations were examined to determine whether there was sufficient independent clusters basis, to proceed with the analysis. Two modifications were introduced to the final model based on preliminary item and scale analyses. These will be discussed later.

Table **11.3** details the Pearson's bivariate correlations for the 12 items measuring the Theory of Planned Behavior. The most of the items within constructs are moderately correlated and are significant at the 0.05 level. Moderately inter-correlated items are better suited to scale development and structural equation modeling since high correlations raise concerns about redundancy with other items. On the other hand poorly correlated items raise concerns about the adequacy of a set of items to effectively capture a latent construct. The item PBC2a exhibited extremely low and non significant correlations with several other items. This item was eventually dropped from the final SEM analysis.

Table **11.3**: **PEARSON CORRELATION MATRIX FOR THEORY OF PLANNED BEHAVIOR VARIABLES (N=287)**

	SUB1	SUB2	SUB4	ATT7	ATT8	ATT9a	PBC5	PBC6	PBC2a	INT11	INT13	INT14a
SUB1	1.000	0.774**	0.582**	0.379**	0.291**	0.311**	0.285**	0.062	0.101	0.495**	0.474**	0.405**
SUB2		1.000	0.573**	0.327**	0.222**	0.248**	0.336**	0.156**	0.087	0.438**	0.395**	0.386**
SUB4			1.000	0.441**	0.337**	0.268**	0.230**	0.054	0.164**	0.382**	0.416**	0.374**
ATT7				1.000	0.588**	0.506**	0.181**	0.064	0.177**	0.377**	0.487**	0.364**
ATT8					1.000	0.368**	0.084	-0.011	0.109	0.339**	0.440**	0.276**
ATT9a						1.000	0.144*	0.097	0.165**	0.325**	0.420**	0.345**
PBC5							1.000	0.476**	0.006	0.656**	0.469**	0.393**
PBC6								1.000	0.068	0.267**	0.081	0.093
PBC2a									1.000	0.054	0.107	0.080
INT11										1.000	0.766**	0.589**
INT13											1.000	0.656**
INT14a												1.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The scale means ranged from 2.81 to 4.28. With the exception of one measure of perceived behavioral control, most measures fell above the mid-point of their range. This indicates that in general health care professionals had more positive attitudes, perceived more social pressure from peers to participate in the ODP and considered themselves as having some individual control over their participation the ODP. The variance-covariance matrix for the factor analysis was created using responses from 287 respondents who completed all the items.

Table **11.4** presents the coefficient alpha reliability, means, standard deviations, and variance for the measurement model. The internal reliabilities of the final four scales were generally acceptable. However, the items comprising

the perceived behavioral control (PBC) scale had a very low alpha (0.403) which could be significantly improved (α =0.645) when the item PBC2a was dropped from the scale. The poor internal consistency of this scale is not surprising given the fact that, as previously mentioned, the TPB literature has consistently found that scales measuring perceived behavioral control often fall below ideal alpha levels. This has been attributed to the belief that behavioral control is a multi-dimensional concept which may be interpreted by respondents as a measure of individual self efficacy, task difficulty or access to resources.

Table **11.4**: **DESCRIPTIVE STATISTICS FOR THEORY OF PLANNED BEHAVIOR VARIABLES**

Construct/ Variables	Reliability (scale α)	Mean	Std. Deviation	Variance
SUBJECTIVE NORM				
SUB1	0.844	4.10	0.813	0.660
SUB2		4.03	0.795	0.632
SUB4		4.28	0.656	0.431
ATTITUDE				
ATT7	0.741	4.42	0.663	0.440
ATT8		4.21	0.793	0.629
ATT9a		4.42	0.889	0.790
Perceived Beh. Control				
PBC5	0.645	3.48	1.096	1.201
PBC6		2.81	1.371	1.881
PBC2a[d]		3.54	1.016	1.032
INTENTION				
INT11	0.859	3.74	1.017	1.035
INT13		3.98	0.904	0.818
INT14a		4.13	1.013	1.026

[d] Item deleted
*** Significant at the 0.001 level
(N=287) Descriptive statistics prior to data transformations

The alpha reliability of the subjective norms scale could also be increased by dropping item SUB4 but the trade off between the small increase in coefficient alpha if the item was dropped relative to the valuable information that is gathered by this item led to its retention. The final subset of 11 items was submitted to structural equation modeling.

Theory of Planned Behavior

The most commonly used statistic for assessing the overall goodness of fit of a structural model is the chi-square (χ^2). The chi-square goodness of fit tests the null hypothesis that the model fits the population data perfectly. The minimum chi-square fit function was χ^2 (39, N=279) 78.747, $p< 0.001$ resulting in a cmin/df = 2.02. Wheaton, Muthén, Alwin, and Summers (1977) suggest that an acceptable model will have a cmin/df ratio of between 2 and 5, but this ratio has lost favor in SEM analysis. However this metric does provide a crude method for evaluating goodness (or badness)-of-fit in which the degrees of freedom serve as a standard by which to judge whether the χ^2 is large or small when the p=value may be significant.

The χ^2 goodness of fit statistic has often been criticized as an insufficient measure because it is known to be sensitive to violations of multivariate normality and sample size such that in larger samples (>200) even trivial deviations from a perfect fitting model are statistically significant (Diamantopoulos and Siguaw, 2000; Jöreskog and Sörbom, 1988). Many studies which employ a simple random sample for data collection are able to take into consideration additional fit

indices which are relatively unaffected by sample size to make judgments about model fit: 1) Rho also known as the Non-Normed Fit Index (NNFI) or Tucker-Lewis Index (TLI) (Tucker and Lewis, 1973); 2) The Comparative Fit Index (CFI)(Bentler, 1990); and 3) Root Mean Square Error of Approximation (RMSEA) (Browne and Cudeck, 1993). However, the data for this study was collected using a complex sampling design and currently the RMSEA is the only additional fit index provided by LISREL 8.72 for complex data analysis. Many researchers are loosely guided by the convention that an RMSEA of less than 0.8 but greater than 0.5 corresponds to an "acceptable fit" model, while a RMSEA of less than 0.5 corresponds to a "good fit" model (Browne and Cudek, 1993; McDonald and Ringo Ho, 2002. The RMSEA of this model is 0.060 which makes it an acceptable model. When analyses are undertaken that ignore complex sample design this leads to substantial biases in parameter estimates and standard errors (Stapleton, 2006; Kaplan and Ferguson, 1999). As a result, analytical conclusions may be generalized to similar samples but not to the wider population from which the sample is drawn (Bentler and Chou, 1987).

Given the overall pattern of fit presented in Table **11.5** , the TPB provides an acceptable fit for assessing the intention of health care providers to participate in the organ donor process, although the combination of a non significant RMSEA, along with a significant chi-square value, is cause for reservation.

Table **11.5**: **GOODNESS OF FIT INDICES FOR TPB MODEL**

GOODNESS OF FIT INDICES	$\chi 2$	p-value	DF	CMIN/DF	RMSEA	p-value (close fit)
Model 1: TPB	78.747	<0.001	39	2.019	0.060	0.176

The measurement model must be duly critiqued as well. It is highly probably that an investigation of the modification indices and items comprising this model may reveal areas where the model may be improved to better fit the data. However this is best tested in a new sample to ensure authenticity. Based on the literature previously discussed one other possible area of comparison is to look at the applicability of the Theory of Reasoned Action (TRA) in this population. This modification will be considered subsequently in this paper.

The TPB model was estimated using maximum likelihood (ML) procedures in LISREL 8.72. All but one of the unstandardized factor loadings are significant (at $p < 0.05$, t-value > $|1.96|$). This confirms the validity of the indicator variables used to represent the latent constructs. ATT7 is the only indicator variable which has a non-significant loading on the attitude construct. The path from SUB to INT was also non-significant (Table **11.6**). Table 11.6 also shows that the latent constructs; subjective norms, attitude and intention explain 41% to 78% of the variance in their respective indicator variables. The construct of perceived behavioral control is much weaker.

Table **11.6**: **PARAMETER ESTIMATES FOR TPB MODEL**

		Factor Loadings (unstandardized)	S.E	t-value	R^2
SUB1	SUB	1.000	-	-	0.726
SUB2	SUB	1.021**	0.107	9.548	0.786
SUB4	SUB	0.745**	0.105	7.072	0.485
ATT7	ATT	0.099	0.174	0.568	0.002
ATT8	ATT	0.914**	0.125	7.314	0.407
ATT9a	ATT	1.000	-	-	0.409
PBC5	PCB	0.135**	0.004	37.066	1.000
PBC6	PCB	0.075**	0.012	6.125	0.232
PBC2a	PCB	omitted			
INT11	INT	1.000	-	-	0.733
INT13	INT	0.953**	0.095	10.064	0.672
INT14a	INT	0.887**	0.117	7.555	0.467
INT	SUB	0.182	0.119	1.526	
INT	ATT	0.714**	0.170	4.212	
INT	PBC	0.056**	0.006	10.052	

*** Significant at the 0.001 level

In evaluating the structural validity of the model we focus on the linkages between the endogenous and exogenous variables (SUB, ATT, PCB, INT). All indicator variables were measured on the same scale. The positive covariances of the exogenous variables and the path coefficients presented in Table 11.6 confirm the positive relationship between subjective norms, attitudes, perceived behavioral control and intention as hypothesized. Attitudes contribute the greatest weight (0.714) to the prediction of intentions compared to perceived behavioral control (0.056) (Figure **11.1**).

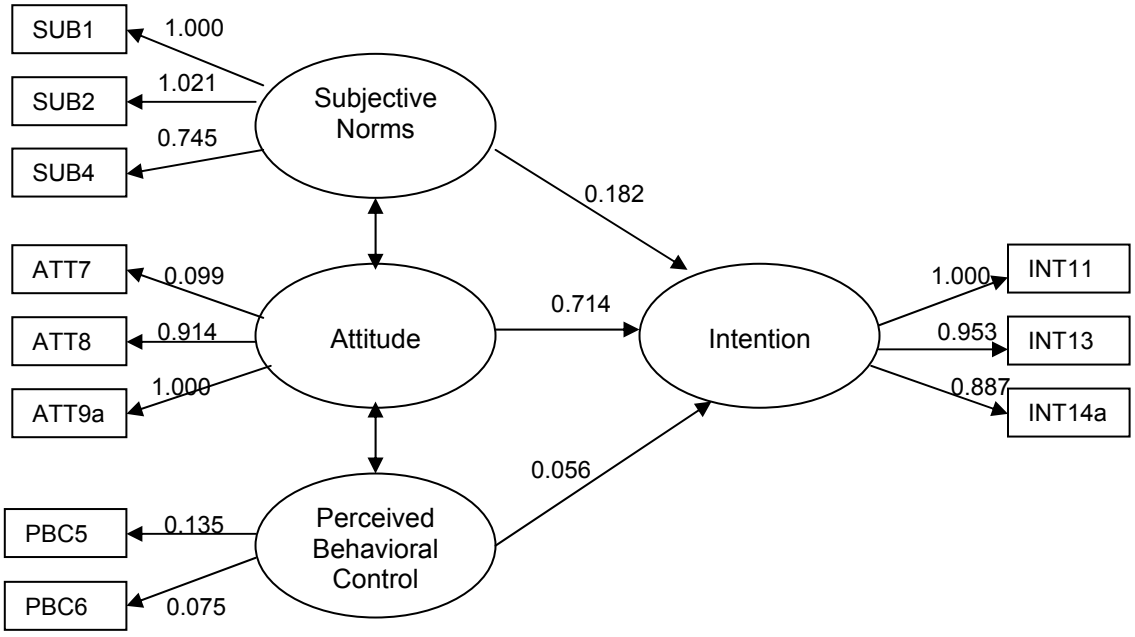

Figure **11.1**: **STRUCTURAL EQUATION MODEL OF THE TPB**

The positive relationships between attitude and intention and between perceived behavioral control and intention are not only positive but significant. This supports the hypotheses:

- H2: *Health care professionals with positive attitudes to the organ donor process are more likely to express intentions to participate in the ODP compared to health care professionals who express less positive attitudes.*
- H3: *Health care professionals are more likely to express intention to participate in the organ donor process if they perceive that they possess a high level of personal control over their participation in the process compared to a perceived low level of personal control over their participation*.

In contrast the positive relationship between subjective norms and intention is not significant. This indicates that among health care professionals,

social pressure to participate in the organ donor process is not significant enough to impact their intention to participate in the ODP. This is counter to the hypothesis:

- H1: *Health care professionals are more likely to express intention to participate in the organ donor process when there is a perception of social pressure among their professional peers for their participation in the process, compared to a perceived lack of social pressure.*

Taken jointly, attitudes, perceived behavioral control and to a lesser extent subjective norms account for 84% of the variance in intention in the model of planned behavior.

As previously mentioned the Theory of Planned Behavior (TPB) is an updated theory to the antecedent Theory of Reasoned Action (TRA). Perceived behavioral control (PBC) was included to account for situations in which individuals lack substantial individual control over the behavior under investigation. After examining the overall fit of the model it was determined that there may be value in comparing the performance of the TBP to the TRA in this population in order to determine whether the TRA provided a better fitting or more parsimonious model for explaining the data. The analysis was rerun without the PBC construct. By dropping PBC from the model we revert to the Theory of Reasoned Action (TRA) for comparison.

Theory of Reasoned Action

Table **11.7** provides a comparison of the fit indices for both models. The goodness of fit indices under consideration (χ^2, RMSEA) improved significantly

using the TRA model. The Theory of Reasoned Action was a good fit for the data and provided a significantly better explanation for the data collected from this population than the TPB.

Table **11.7**: **GOODNESS OF FIT INDICES FOR TPB AND TRA**

GOODNESS OF FIT INDICES	$\chi 2$	p-value	DF	CMIN/DF	RMSEA	p-value (close fit)
Model 1: TPB	78.747	<0.001	39	2.019	0.060	0.176
Model 2: TRA	34.740	0.072	24	1.448	0.040	0.693

The TRA model was also estimated using maximum likelihood (ML) procedures in LISREL 8.72. All but one of the unstandardized factor loadings are significant (at $p < 0.05$, t-value > $|1.96|$). This again confirms the validity of the indicator variables used to represent the latent constructs. ATT7 is the only indicator variable which has a non-significant loading on the attitude construct (Table **11.8**). Table 11.8 also shows that the latent constructs subjective norms, attitude, and intention explain 40% to 80% of the variance in their respective indicator variables.

Table **11.8**: **PARAMETER ESTIMATES FOR TRA MODEL**

	Factor Loadings (unstandardized)		S.E	t-value	R^2
SUB1	SUB	1.000	-	-	0.723
SUB2	SUB	1.023**	0.109	9.344	0.786
SUB4	SUB	0.745**	0.105	7.072	0.489
ATT7	ATT	0.013	0.179	0.073	0.000
ATT8	ATT	0.901**	0.126	7.170	0.402
ATT9a	ATT	1.000	-	-	0.417
INT11	INT	1.000	-	-	0.607
INT13	INT	1.139**	0.150	7.598	0.795
INT14a	INT	1.013**	0.179	5.644	0.504
INT	SUB	0.302**	0.124	2.437	
INT	ATT	0.691**	0.188	3.679	
***	Significant at the 0.001 level				

In evaluating the structural validity of the model we focus on the linkages between the endogenous and exogenous variables (SUB, ATT, INT). All indicator variables were measured on the same scale. The positive covariances of the exogenous variables, as well as the path coefficients presented in Table 11.8, confirm the positive relationship between subjective norms, attitudes, and intention as hypothesized. Attitudes again contribute the greatest weight (0.691) to the prediction of intentions compared to subjective norms (0.302) (Figure **11.2**).

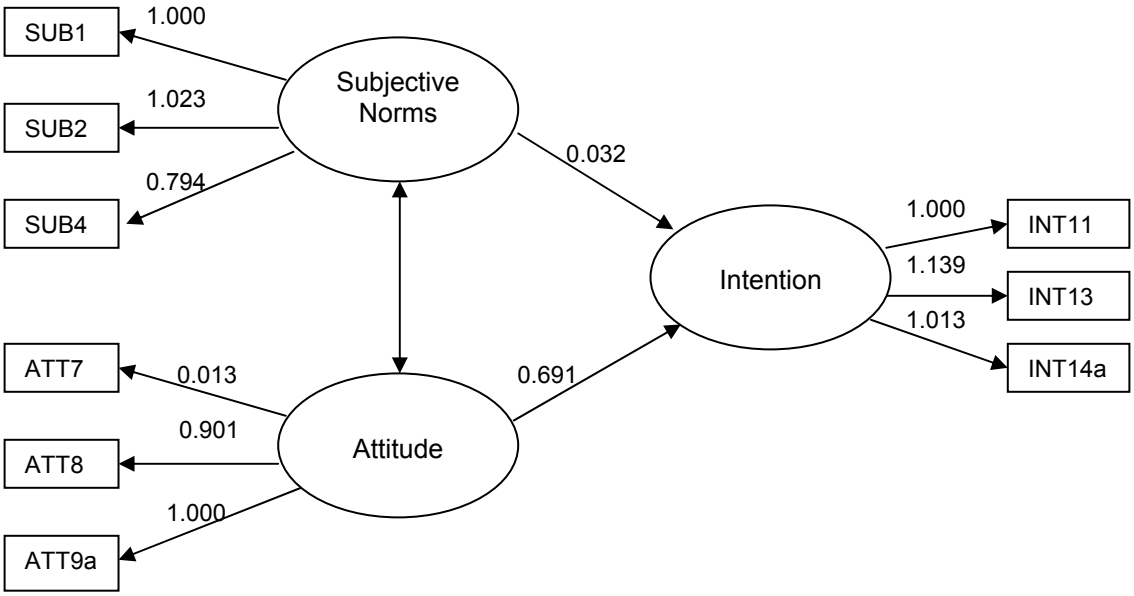

Figure **11.2**: **Structural Equation Model of the TRA**

The positive relationships between attitude and intention and between subjective norms are not only positive but significant. This result is different from the Theory of Planned Behavior model. These results support the following hypotheses:

- H1: *Health care professionals are more likely to express intention to participate in the organ donor process when there is a perception of social pressure among their professional peers for their participation in the process, compared to a perceived lack of social pressure.*
- H2: *Health care professionals with positive attitudes to the organ donor process are more likely to express intentions to participate in the ODP compared to health care professionals who express less positive attitudes.*

Taken jointly, attitudes and subjective norms account for 61% of the variance in intention in the TRA compared to 84% accounted for by subjective norms, attitude and perceived behavioral control in the TPB. Both models provide evidence that attitude is the most significant determinant of intention to participate in the ODP among this group of health care professionals.

Chapter 12

Discussion

The TPB was proposed as a good model for testing health care professional's intention with regards to the organ donor process because their participation within their hospital is a professional directive which is stipulated by the health care system and mandated by the federal agencies which provide financial support. This rationale suggests that perceived behavioral control (PBC) would be an important construct for accounting for variance in the TPB model above and beyond that which is accounted for by the TRA. There is, in fact, a substantial increase in the variance that is accounted for when the TRA (R=0.61) is compared to the TPB (R=0.84). However, there is concern about the extent to which measurement "noise" in the PBC contributes to this gain in explaining variance. In contrast, the TRA model was a "good model" for the data compared to the TPB which was an "acceptable" model.

It was not surprising to find that the attitude construct had the strongest relationship to intention to participate in the organ donor process. Whereas considerable support exists for the link between attitude and intention (Ajzen, 1988; Eagly and Chaiken, 1993), the evidence for the link between subjective norms and intention is mixed (Ajzen, 1991). Studies that support this link often report a relatively small contribution of subjective norms both in terms of absolute vales as in relation to attitude and other predictors in the model (Godin and Kok,

1996; Sheppard, Hartwick, and Warshaw, 1988). What was interesting is that subjective norms did not significantly impact intentions at all. And while it is in fact it is logical to surmise that among groups of health care professionals', participation in the organ donor process is driven more by personal and professional attitudes to the process than by social pressures from professional peers. It is noteworthy that subjective norms are non-significant.

The measurement/interpretation difficulties reported by a myriad of previous studies also recurr in this study. The perceived behavioral control scale had a relatively low internal consistency, but the alpha coefficient of the final two items that were retained was well within the range identified for previous studies. It is difficult to determine what accounts for the "noise" around the PBC measure among health care professionals working in this hospital system.

What is rather informative as well is the unexpectedly high perception of the level of individual control over participation in organ donation activities among health care professionals. When a hospital policy is mandated by Medicare Conditions of Participation (CoP) one would expect that health care professionals within federally sponsored hospitals would report a much lower level of individual control over their participation as well as a higher level of intention to participate in organ donation activities within the hospital in the future. The level of individual control over participation and intention to participate in the future should not be a reflection of personal position on organ donation or the organ donor process. On the contrary, it should be a reflection of the professional

obligation instilled in health care professionals by their unit supervisors and hospital administrators.

The level of individual control that health care professionals have over their participation in organ donation activities within the hospital system is most likely a multidimensional concept which may be interpreted by respondents as individual self efficacy, personal commitment, task difficulty or access to organizational resources. In this instance it would have been challenging to determine the specific facet of individual control that is driving respondents' responses while preserving the parsimony of the measurement model. It may be difficult to communicate this subtle distinction solely through a quantitative survey. The richness of data needed to delineate this distinction and augment previous findings is best garnered through a qualitative study.

Item PBC2a, which was dropped from the final analysis, was designed to capture the "pressure" that health care professionals felt to participate in the organ donor process. This item affected the uni-dimensionality of the PCB construct considerably and was excluded from the final analysis. However the mean of this item also reflected the prevailing finding that health care professionals do not feel professionally obligated to participate in the organ donor process. It is well known by health care professionals that there is little or no punitive repercussion for critical care staff who do not participate in the ODP. This further institutionalizes a laissez-faire attitude to participation among staff and leaves the burden of meeting donation-related goals on the shoulders a small cadre of dedicated staff and donation champions who are personally

committed to the process. These individuals serve as the primary initiators of the organ donor process within their hospital. They encourage others within their units to make referral calls, and they assist peers who may be overwhelmed or unsupportive or uninterested in the organ donor process.

It is this disconnect between the official position of the hospital system on organ donation and what actually happens within the critical care units that further emphasizes the need to identify the individual and organizational barriers to a successful organ donor process. This will help to inform hospital administrators and the OPO's hospital development and organ procurement staff about the best areas to target for in-hospital professional education and training.

Implications for Future Research

The abbreviated model of the Theory of Planned Behavior proved not to be the most parsimonious model for explaining the data in this sample. The construct that proved the most difficult to interpret was perceived behavioral control. By necessity one of the primary areas for future research at this time would be to further refine the indicator variables of PBC in this population since participation in the organ donor process is clearly not at the sole discretion of health care professionals. It is necessary to determine whether the difficulties with this PBC construct were the result of individual interpretation of the indicator variables or whether health care professionals indeed feel little compulsion to follow the organ donation mandate set forth by the federal government and the health system.

It will also be particularly informative to replicate a study such as this with longitudinal data collection. The TPB clearly has a temporal dimension which was not captured in this study due to constraints of the larger study and ongoing interventions. It may very well be that when the entire model is taken into consideration the TPB may perform differently in this population. A final idea for future research that should also be addressed is to replicate this study in a larger sample with more physicians represented. The responses of physicians are important because their support of nurses who lead the ODP is important to its continued success.

Implications for Policy and Practice

This health system is a recognized leader in organ donation and transplantation technology and as such supports the most current best practices and clinical protocols for successful enactment of the ODP. Donation activities within leading organ donation hospitals have traditionally focused heavily on increasing technical and clinical knowledge among persons involved in the donor process. Despite these efforts the estimated number of potential donors missed each year across the US has only decreased 11% from 27% in 1990 to 16% in 1999 (Sheehy et al., 2003; Gortmaker, Beasley, Brigham et al.,1996). There is a dissonance between the professionally espoused standards and actual practice of health care professionals involved in organ donation activities (DHHS/HRSA, 2003). It is evident from prior research that the reasons for the dissonance are not solely rooted in the shortcomings of donation-specific technical and clinical

competencies, but also impacted by individual attitudes, perceived behavioral control, and the subjective norms which characterize the health care environment.

The results of this study will provide a framework for guiding administrators beyond mere descriptions of medical staffs' shortcomings in donation-related behavior toward incorporating assessments of the organizational culture and individual perceptions which influence health care professionals' participation in the ODP. The Theory of Planned Behavior is useful for policy makers, educators and health care administrators who desire to demonstrate a shift in perspective that better facilitates congruence between the espoused professional standards for adherence to the organ donor process and actual practice.

Limitations

Several limitations are worth mentioning since they impact the study's implications and generalizability.

1. One limitation of this study was the low representation of physicians in the sample. The response rates achieved in studies that examine professional beliefs, attitudes or practices among medical staff, particularly physicians, vary greatly. Surveys which are low in complexity or length, or those that offer monetary compensation or honorarium, professional advancement or that carry a perception of prestige, usually report higher response rates than those that offer less valuable inducements or none at all (Mysliwiec, Brown, Klabunde, and Ransohoff, 2004; Cabana, Slish, Brown, and Clarke, 2004; Zeirler, Meissner,

Cain, Strandness, 2002; Gross, Marguccio, and Martinoli, 2000; Molzahn, 1997b). Low response rates seem endemic to non-compulsory research conducted among healthcare professionals (Groves, Presser and Dipko, 2004). Groves et al. (2004) found that in addition to monetary incentives, and survey complexity, other factors which influence response rates among physicians are perceived importance of the both the topic studied and entity conducting research. Any of these factors may reasonably be expected to impact the response rate achieved in this study since the incentives offered for participation were nominal.

2. A second limitation of this study is that it is cross-sectional in nature. This precludes us from being able to predict future behavior from current intentions at this stage. It is important to note that the purpose of this study is not to effect behavior change or measure behavior change over time but to provide better understanding of the applicability of the theoretical model in a unique population and context. This study will also serve to make recommendations about research methods and interventions and that may be employed in subsequent research.

3. A third limitation of this study is the fact that several common goodness of fit indices are not provided by LISREL 8.72 software when complex samples are analyzed. This means that the researcher doesn't benefit from a complete picture of model fit indices and must rely on only two.

4. A final limitation to the generalizability of this study is the fact that it was carried out in a specific hospital system with its unique culture, strengths and

shortcomings. The experiences and expectations of health care professionals within this hospital system are not necessarily the experiences and expectations of health care professionals in donation/transplantation hospitals throughout the US. However, the hospitals within this health system: (a) represent small, medium and large hospitals, (b) represent high, medium and low donor potential hospitals, and (c) represent highly supportive and unsupportive units.

Chapter 13

Relational Coordination in the Organ Donor Process: Views and Perceptions of Critical Care Nurses

The medical and administrative staff involved in the organ donor process is loosely treated as an interdisciplinary team throughout this study. They represent a micro-system within the larger organization, with its own coordinated responsibilities and specific outcome measures. Coordination has been described as the management of interdependencies between persons or team members. It is validated through routines, schedules, preplanning or standardization of work processes in an organization (Gittell, 2000). Berwick (2002) identifies the micro-systems level of an organization such as a hospital, as the level where work happens and where a small team of persons with their information systems, and client population, carry out a defined set of work processes. This idea is supported by Ehrle, Shafer and Nelson (1999) who suggest that the organ donor process should be viewed as hospital “code”, reminiscent of cardiac failure emergencies and multiple major trauma admittances. That is, it is best enacted as a process characterized by a well-defined sequence of interactions between staff who understand their individual roles, responsibility and accountability in the organ donor process (ODP).

Gittell (2000) agrees that coordination is facilitated by formal structures and design elements such as clinical pathways and information systems. Gittell (2000) also argues that while these formal structures are essential, it is also

important to focus on the interactions between health care providers that impede or enhance effective coordination. Coordination does not occur in a relational vacuum but is instead a series of interactions between participants (Gittell, 2002b). Therefore a successful organ donor process is best maintained by a web of relationships. Sometimes those who attempt to describe or improve the performance of a clinical model for a hospital's donor process, often do so without emphasis on the complementary effect of relational issues. These include the communication, shared knowledge, shared goals and mutual respect among the nurses, physicians and clinical administrators involved in the organ donor process.

Study Purpose

Relational coordination is evidenced by how well health care professionals involved in organ donation, carry out the social, technical, medical, and interactive tasks which precede successful organ recovery. This study is designed to advance our understanding of how the relationships between the loosely organized teams, who facilitate the organ donor process within the health care system, efficiently facilitate the coordination of their responsibilities. While it is obvious that knowledge of the ODP is important to its enactment within the health care system, it is more often the interpersonal, and not the technical aspects of the process that health care professionals find most difficult (Molzahn, 1997a; Prottas, 1995). The qualitative approach of this study will allow for a richer and more robust articulation of the actions, reactions and perspectives of health care professionals involved in the organ donor process. Conversely, the

aggregate nature of quantitative research is not able to delineate the most relevant and/or problematic relational issues that enhance the organ donor process or impede it.

Chapter 14

Theoretical Framework

Theory of Relational Coordination

This study integrates the critical pathway for guiding organ donor care, also referred to as the organ donor process or ODP throughout this paper, (Shafer, Kappel, and Heinrichs, 1997) (Figure 1.1) with the relational model of coordination (Gittell, 2002a) (Figure **14.1**). This framework is then used as a lens through which to qualitatively compare and contrast nurses' perceptions of the relational issues which impact the organ donor process within their hospitals. The relational model of coordination as conceived by Gittell (2002a) is a communication and relationship-intensive form of coordination that is particularly applicable to the type of organizational setting in which donation is carried out. These highly uncertain, interdependent and severely time constrained settings include the hospital emergency room, surgical units, trauma units and critical care units. (Gittell, 2002a). While traditional organizational theory espouses the value of boundary spanners, clinical protocols, and team meetings as core facilitators of organizational coordination (Levitt and March, 1986; Davenport and Nohria, 1994), relational coordination posits that the microdynamics of coordination are more fundamentally a process of interactions between team members (Gittell, 2002b).

Inadequacies in a health system's programmed coordination or interactive coordination as evidenced by ill-defined or poorly executed team member roles, and misinformation are among the main reasons that health care professionals unknowingly or erroneously exclude suitable donors (Beasley et al., 1997).

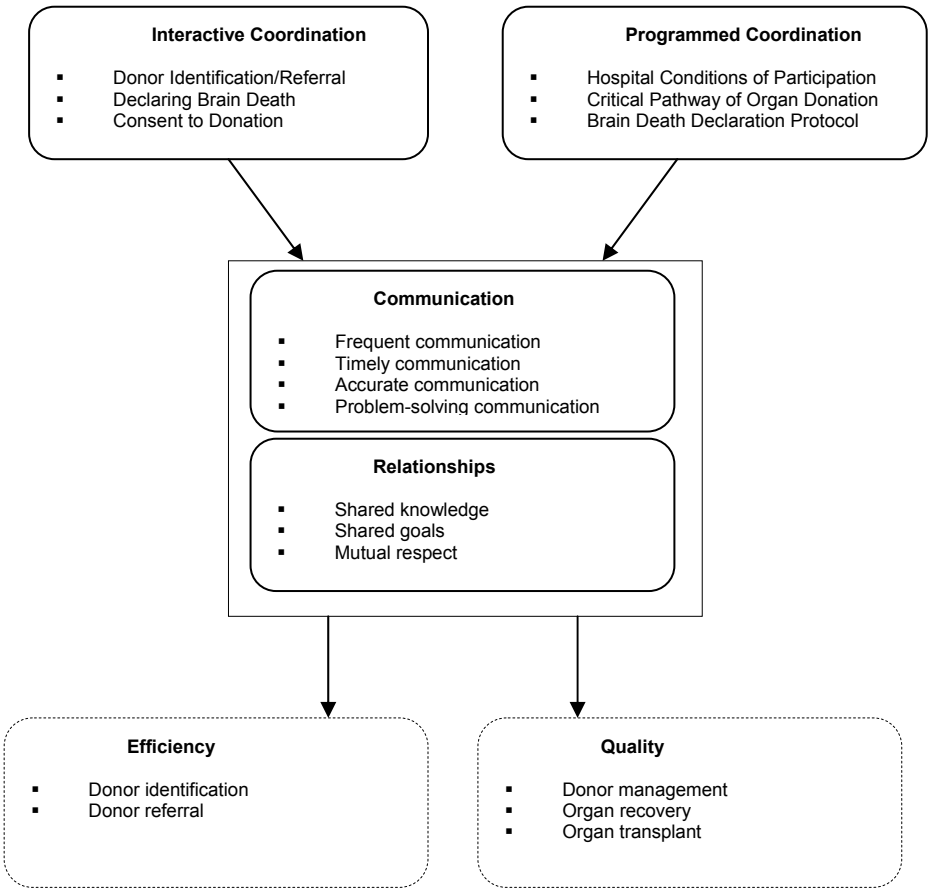

Figure **14.1**:**MODEL OF ORGAN DONATION COORDINATION MECHANISMS, COMMUNICATION, RELATIONSHIPS AND PERFORMANCE.(ADAPTED FROM GITTELL 2002)**

Programmed Coordination

Klassen, Klassen, Aronoff, Hall, and Braslow (1999) suggest that only 30%-50% of eligible deaths result in a referral. Lack of explicit guidelines and misinformation on key events are among the main reasons that hospital staff unknowingly or erroneously exclude suitable donors from evaluation by the organ procurement organization (Beasley et al., 1997). Programmed coordination when well executed, ensures that organizational infrastructure facilitates the processes necessary for adhering to the requirements of the correct standard of care. The nature of programmed coordination relevant to this study is the critical pathway of organ donation, which subsumes the federal Medicare Conditions of Participation (CoP) requirements for reporting all deaths as well as the organizational protocol for brain death declaration. Recent work by Gittell, (2002b) concludes that coordinating mechanisms such as clinical pathways are found to be effective only to the extent that they are facilitated by reciprocal relationships and communication among health care professionals involved.

Interactive Coordination

Interactive coordination refers to unambiguous identification of key roles, responsibility and accountability for all individuals and functional groups involved in a coordinated work process (Gittell, 2000b). It is important that the appropriate job descriptions, responsibilities, centers of power, authority, and control of key process should be assigned to all health care professionals involved in the organ donor process. However, Tokalak et al. (2004) found that in donation activities staff roles are frequently ambiguously defined. More often than not, there is no

single person assigned the overall responsibility to ensure a well orchestrated organ donor process. The nature of the interactive coordination mechanisms relevant to this study are not always clearly defined and formalized within the health system being studied. However we posit that relative to interactive coordination, the areas with greatest need for unambiguity within the organ donor process are donor identification and referral, declaring brain death and communicating with families for consent to donation.

Chapter 15

Review of the Literature

The Organ Donation Breakthrough Collaborative in its September 2003 report reiterated the fact that organ donation is a complex process that relies on various functional groups working together to optimize outcomes at all nodes of the organ donor process (DHHS/HRSA, 2003). The relational model of coordination posits that the coordination of highly interdependent work among a group is most effectively carried out when shared goals, shared knowledge, and mutual respect supports -- and is supported by-- frequent, timely, accurate and problem-solving communication (Gittell, 2003). These seven dimensions of relational coordination were developed by Gittell through inductive field research and then further validated through two empirical studies. In one study of the impact of relational coordination on quality of care, post operative pain and functioning, and length of stay among patients who had undergone total joint arthroplasty, Gittell (2000) found that there were significant associations between these important quality indicators and the level of relational coordination among team members involved in patient care. Additionally, all dimensions of relational coordination were significantly associated with patient perceptions of quality of care they received (Gittell, 2000). Subsequent research expanding on the relational model of coordination in the health care service setting found that even when accounting for the influence of customer-provider relationships, the level of

relational coordination between providers has a positive, independent association with customer satisfaction (Gittell, 2002a).

Much effort has been directed towards educating health care professionals on the work processes and best practice protocols necessary for organ donation. However, anecdotally it seems that not as much effort has been invested into educating health care professionals and OPO staff about the salience of high quality relationships and communication among all members of the organ donation team. Relational coordination is indispensable to a successful organ donation program because it improves the exchange of relevant information that is important in each organ donor case.

Relational Coordination

Communication

According to Gittell (2003), high quality relationships and communication enhance coordination efforts. Conversely, low quality relationships and poor communication have the opposite effect. Baggs (1994) identified two earlier studies by Overton, Schnech, and Hazlett (1977), and Leatt, and Schneck (1981) which point to the need for independent judgment and frequent communication between health care professionals who operate in complex, dynamic unpredictable hospital environments. Organizational infrastructure supporting *frequent, timely, accurate and problem-solving communication* should be in place at the hospital level to consistently ensure that physicians, nurses and OPO personnel are able to meet both the federally mandated donor referral criteria as well as hospital and OPO stipulations regarding all donation-related activities. If

there is a failure in any aspect of the organ donor process it should not only be resolved as quickly as possible, but necessary changes to organizational protocol/infrastructure should be made in a timely fashion so as not affect future events.

Relationships

Mutual respect, shared knowledge and shared goals are important in building common ground among the members of the organ donation team. According to Gittell (2002b) respect for the work of others encourages each individual to value the contributions of their colleagues and to be cognizant of the impact that their actions have on their colleagues. If health care professionals perceive that they are not respected by others, or if health care professionals are disinclined to respect others with whom they share interdependent tasks, then there tends to be a lower frequency of communication that is timely, accurate or geared towards solving problems. Similarly, if participants hold tenaciously to disparate or even conflicting goals for interdependent work processes, or if they are not operating in the context of a shared knowledge set, then they are more likely to contribute to a dis-integrative effect on the overall work process (Gittell, 2003). They are also more likely to be involved in blaming rather than problem solving when problems do occur, and less able to make judicious judgments regarding the timeliness and accuracy of the information they should be communicating to other team members.

Research Questions

It is imperative that health care administrators be aware of the need to

assess and ultimately enhance the relational mechanisms that facilitate successful organ donation, if they are to maximize donor potential in their hospitals. Therefore this study attempts to qualitatively answer the following research questions:

- ***How do nurses depict the relationships among key stakeholders who participate in the organ donor process?***

- ***How do nurses depict the communication among key stakeholders who participate in the organ donor process?***

- ***Do nurses perceive the enactment of the work processes critical to the first four nodes of the organ donor process, as conforming to the professional standards espoused by the critical pathway of organ donation?***

- ***As nurses perceive it, which discreet work processes are most impacted by shortcomings in programmed coordination, interactive coordination and relational coordination?***

Chapter 16

Methods

Study Design

This qualitative study retrospectively explored nurses' perceptions of the relational coordination concepts such as; mutual respect, shared knowledge, shared goals, and communication (*frequent accurate, timely and problem-solving*). As previously described, shared knowledge situates health care professionals cognitively, shared goals situate health care professionals motivationally, and mutual respect situates health care professionals socially in relation to others on the organ donor team (Gittell, 2002b).

Quantitative research is predominated by methods which view the world as a concrete structure and seeks to manipulate data by treating the social world as a static phenomenon which reduces the role of human beings to elements subjected to a deterministic world (Morgan and Smircich, 1980). Qualitative research on the other hand explores phenomenon in their natural settings, attempting delineate phenomena in terms of the meaning those involved bring to them (Denzin and Lincoln, 1994). When presenting the findings of qualitative research as this paper does, it often behooves the researcher to qualify the epistemological (*what is true?*), ontological (*what is real?*) and methodological (*how can we best find out?*) assumptions that guide his/her interpretations in order to remain as transparent as possible to the reading audience. This researcher ascribes to the constructivist paradigm which assumes that there are

multiple realities, the researcher and respondent create their own understanding, and knowledge is accumulated through naturalistic methodological procedures (Guba and Lincoln, 1994).

Study Population

The health system employs more than 32,000 employees in nine hospitals. However, it is mainly the responsibility of health care professionals in the Intensive Care Units (ICU and CICU), Neurosurgery, Neurology, Trauma, Critical Care Units and the Emergency Department (ER), supported by clinical administrators and the organ procurement organization (OPO), to initiate and sustain the ODP. Health care professionals from key functional groups such as physicians and nursing staff in these departments as well as administrators and professionals representing the organ procurement organization were targeted for both the semi-structured and open-ended interviews.

Two to eight health care professionals representing physicians, nurses and clinical administrators were recruited from the nine hospitals. A final sample of 33 individuals participated in the qualitative interviews. They were identified through OPO records of persons who had participated in at least one organ donor case and/or were considered highly supportive of organ donation in their hospitals. Participation in the interviews was voluntary and respondents were assured of confidentiality. The participants selected for this project are employees of a multi-hospital health system in the mid-west United States. All interviews took place on-site at the participating health system hospitals.

Data Collection

Qualitative data was generated by conducting both face-to-face semi-structured interviews and face-to-face open-ended interviews with key informants in the health system. Using key informants in qualitative research is particularly appropriate when facing a lack of archival data on organizational- or individual-level constructs of interest such as; interpersonal relationships and communication, and when the subject under investigation is such that in-depth information cannot be expected from a representative sample of respondents (Kumar, Sterns, and Anderson, 1993). A sample of physicians, nurses and nursing administrators were recruited based on their involvement in a range of organ donor processes, involvement in key donation processes, or their capacity to monitor or influence donation activities within their hospital. They were not chosen to be statistically representative of the organization but because they are intimately familiar with the organ donor process and willing to communicate about their generalized observations and/or expectations. All respondents were recruited individually via fax, with telephone and e-mail follow-up for confirmation to participate in the interviews. They were not apprised of the specific interview questions before hand.

In total, nine interviews were conducted in Hospital A with critical care nurses from the medical intensive care unit, coronary intensive care unit, cardio-thoracic intensive care unit, and neuro-intensive care unit. Seven interviews were conducted in Hospital B with critical care nurses in the emergency department and intensive care unit. Four interviews were conducted in Hospital

C with critical care nurses in the intensive care unit. Four interviews were conducted in Hospital D with critical care nurses in the surgical intensive care unit and neuro-intensive care unit. Three interviews were conducted in Hospital E with critical care nurses in the intensive care unit. Three interviews were conducted in Hospital F with critical care nurses in the intensive care unit. Two interviews were conducted in Hospital G with critical care nurses in the intensive care unit. One interview was conducted in Hospital H with a critical care nurse in the intensive care unit.

All interviews were conducted during the nurses' regular shifts at the hospital where they worked. This often presented severe logistical and time constraints for conducting an in-depth interview. Due to these constraints it was determined that three demographic questions and two lead-in questions related to coordination and communication be "dropped" from the interviews. These questions were addressed only if there was reasonable time at the end of the interview.

Instrumentation

Interviews

The items for the semi-structured interview were adapted from an empirical study of relational coordination among healthcare professionals in surgical care for joint replacement patients in acute care hospitals (Gittell, 2002b). The interview protocol went through two iterations before a format suitable to the respondents' available time and interpretative context was finalized. The initial interview protocol consisted of 13 semi-structured questions

and 1 open-ended question which were tested on twelve eligible respondents (See Appendix A). It was found that the semi-structured questions were not best suited to collecting the rich information that this study sought to access. In the field and upon reflection, it was found that; it is difficult to translate open-ended responses into ordinal scales, the researchers personal use of scales for recoding information was "distracting" to respondents, and finally respondents were more likely to give responses to scaled items that were rated much higher their open ended/unsolicited conversation seemed to indicate.

The decision was made to restructure the interview protocol into a completely open-ended format for the next round of interviews with a new sample of participants. The revised interview protocol was a combination of descriptive, evaluative and non-specific questions (Whyte, 1984). The four opening items collected information on respondent's involvement in the organ donor process in their hospital and their recollection of the other heath care professionals with whom they collaborate in order to fulfill their donation-related responsibilities. Additional information was collected on respondents' perceptions of the relationships and coordination, knowledge, interdependence, and shared goals that are reflected in the interactions that occur between health care professionals involved organ donor cases. The emergent interview themes were aggregated to the health system without individual or hospital identifiers. Table **16.1** details the transition in questions between the initial and final interview formats along with the topical areas covered.

Table **16.1**: **QUALITATIVE INTERVIEW QUESTIONS**

CONTENT	FIRST INTERVIEW PROTOCOL	SECOND INTERVIEW PROTOCOL
Demographic		Tell me a little about what you do here at the hospital? How long have you worked here? Is your training primarily critical care or have you worked in other clinical areas as well? Have you ever been involved in an organ donor case while here in this unit or hospital?
Interactive Coordination	As best as you can, identify your assigned role/roles in the organ donor process? What other tasks/roles do you perform in the organ donor process? Do you feel proficient at performing your tasks/roles in the organ donor process?	How would you describe your professional role in the typical organ donor case?
Programmed Coordination	Who are some of the persons (occupational/functional groups) you work with to accomplish your tasks related to the organ donor process?	How is the coordination between the professionals involved in the ODP usually carried out? How would you characterize/evaluate the coordination between individuals who may be involved in an organ donor case?
Communication	In general, how frequently do you communicate with other members of the organ donor team on a typical organ donor case? On a 5-point scale, rate the extent to which this frequency of communication is sufficient for you to MOST efficiently perform your roles. In general, how accurate is the information provided in communication between you and other members of the organ donor team on a typical organ donor case? On a 5-point scale, rate the extent to which the accuracy of information communicated is sufficient for you to MOST efficiently perform your roles. In general, how timely is the communication between yourself and other members of the organ donor team on a typical organ donor case? On a 5-point scale, rate the extent to which the timeliness of information communicated is sufficient for you to MOST efficiently perform your roles. In general, how often do other members of the organ donor team work with you to resolve any challenges/problems faced on a typical organ donor case? On a 5-point scale, rate the extent to which opportunities for problem-solving provided within the donor team are sufficient for you to MOST efficiently perform your roles.	Give me some idea of how the various professionals involved in the organ donor process (ODP) communicate with each other (i.e. roles, responsibilities, expectations, hierarchies)? In your opinion how well does this communication process work for all involved? Do you think it adequately serves everyone's needs?

CONTENT	FIRST INTERVIEW PROTOCOL	SECOND INTERVIEW PROTOCOL
Relationships	In general how knowledgeable are the other members of the organ donor team about your unique role/s in a typical organ donor case? On a 5-point scale, rate the extent to which the level of knowledge among members of the organ donor team regarding your role/s in the organ donor process is sufficient for you to MOST efficiently perform your roles. How would you describe the level of interdependence (define) that actually exists between your role/s and the role/s of other members of the organ donor team who carry out a typical donor case? On a 5-point scale, rate the extent to which this level of interdependence between practitioners is sufficient for you to MOST efficiently perform your role/s in the organ donor process. In general how much would you say the other members of the organ donor team support your role on a typical organ donor case? On a 5-point scale, rate the extent to which this level of support is sufficient for you to MOST efficiently perform your roles. How clearly defined are your hospital/department/unit goals, objectives and expectations for delivering a successful organ donor process? In general to what extent do other members of the organ donor team share the same goals for handling a typical organ donor case? On a 5-point scale, rate the extent to which the goals that are shared allow you to MOST efficiently perform your roles.	How would you describe the level of interdependency that exists between you (your professional group) and other health care professionals (other professional groups) in your hospital?
Strengths/ Weaknesses	One of the things that make interdisciplinary teams work efficiently is the ability for members to be very aware of what other team members do and even fill in for them if the need arises. However, clinical specialties, skills, and coordination between units are usually standardized or programmed guidelines for each member of the team. With respect to the roles that you are able to perform, do you think the scope of your specifically assigned roles impede or enhance enactment of organ donation in your hospital?	In your opinion what are the strengths (individual/organizational) or the organ donor process in your hospital? In your opinion what are the weaknesses (individual/organizational) or the organ donor process in your hospital? How can it be improved?

Analytical Plan

Interviews

Each participant was interviewed once. The interviews which ranged in times from 15 - 25 minutes were conducted at eight of the nine hospitals in the health care system. As recommended by Gittell (2003), the interviews were designed to elicit respondents' perceptions of typical patterns in relational coordination between functional groups involved in the first four nodes of the organ donation process (*donor identification, donor referral and evaluation, brain death declaration, & consent*), rather than their analysis of any one specific incident. Participation was voluntary and participants received no direct compensation for their time. However, after the interviews were completed, two critical care nurses in each participating hospital were selected by random drawing to receive a gift card of nominal value as a gesture of thanks.

Analysis of Interview Data

The interviews were audio taped where there was full cooperation and consent of the interviewees. The interviews were then transcribed and entered into the qualitative analysis software program ATLAS.ti. ATLAS.ti software provides a means of storing transcribed data and facilitates the development and tracking of codes, categories and themes.

Data units (i.e. participant responses) were analyzed using the techniques of "the constant comparative method" and "theory elaboration" as described by Straus and Corbin (1994) and Vaughn (1992) respectively. Using this methodology, an existing theory is elaborated and modified as new data is

played against it and meticulously explored to see if new data units fits, how they fit, and how they might not fit (Strauss and Corbin, 1994).

The first level coding was descriptive, open coding, where individual data units were taken at face value and assigned a code which reflected the salient ideas. The second order coding was evaluative. At this stage the first order coding was evaluated in context of the theoretical framework. A coded response confirmed and expanded the understanding of a concept if it fit into an *a priori* theoretical concept. Conversely, if a coded response did not fit into an *a priori* theoretical concept it was assigned a new conceptual category and assessed to determine what new information it brings to the existing theory. The methodology used in this qualitative study can also be described as a systematic assessment of plausible relationships in new data based on the existing Theory of Relational Coordination. The overarching conceptual domains which guided coding decisions were interpersonal communication and relationships.

Communication in this study was not limited to general descriptive assessments of whether communication was frequent, timely, accurate or solving problems. But also examined elements of verbal and nonverbal communication, communication skills, communication style, and hierarchy of how information usually flows through the ODP. Relationships were not only evaluated in terms of whether there was mutual respect, shared goals and shared knowledge. But also included descriptors of the groups of health care professionals that work together, how well these health care professional work together, and the relationships between health care professionals, patients and families.

Chapter 17

Results

The responses of thirty-one health care professionals were considered for qualitative analysis. The final sample of five males and twenty-six females represented only nurses and nursing administrators in eight of the nine hospitals in the health system. These respondents were involved in the organ donor process in the health system at least one time. Two physicians participated in the first phase of the qualitative interviews. However, their interpretation and responses to the semi-structured interview questions indicated that the interview schedule was not wholly applicable to their experiences and involvement in the organ donor process. In addition, it was decided that due to the low participation of physicians in the interviews that is was best to restrict the final analysis and conclusions to the group of nurses who participated.

The following analysis discusses the occasions within the health system for interactive coordination and programmed coordination in turn. It first presents nurses' self-reported perceptions of each type of coordination, second it addresses the relational issues and challenges, third and finally the discussion summarizes the relational strategies that nurses use to bridge shortcomings in both interactive and programmed coordination of the organ donor process (ODP).

Interactive Coordination

Team Identity in ODP

Based on their experiences with the organ donor process, most nurses identified their team members as other nurses, as well as neurologists (physician), house officers (physicians), intensivists (physicians), pulmonologists (physicians), residents (physicians), respiratory therapists (technicians) and the OPO (organ procurement agency). Nurses also reported working with the primary care physician, clergy, social workers, case managers, and the coroner in the organ donor process. While nurses identified several functional groups with which they work, the frequency and extent of these interactions was not consistent across groups. Nurses interacted with other nurses, the organ procurement agency, and the house officers/residents at much higher frequencies and higher levels of interdependency than they interact with other specialist physicians, and respiratory technicians. The interaction between critical nurses with the clergy, primary care physicians or social workers is even less.

Generally, nurses described the experience of working with these other clinical groups as a positive experience. The characterizations ranged from “we work like a well-oiled machine” to “it’s kind of like a nice conglomeration of…teamwork”. Nurses believed that the roles of each clinical group were clearly defined. However, critical care nurses did not seem to buy into the interdisciplinary/interdependent nature of the relationships between the clinical groups involved in the ODP. One nurse described her experience as “we’re

supportive but function independently" and another said "I don't know that there is a lot of interdependency. There are consults…and they are able to do what they do and the nurses are able to do what they do". While the nurses recognize that each clinical group involved in the ODP has a unique role and that clinical groups depend on each other to some extent to make the process run smoothly, most stop short of truly conceptualizing the various functional groups as an interdisciplinary team associated with specific clinical processes and protocols.

Nurse Roles in ODP

Nurses characterized the organ donor process as nurse driven and nurse sustained. With regard to the ODP nurses see their primary role as being the health care professionals who identify donors, make the referral call to the OPO and report to the OPO consistently throughout their shift while a donor patient is on the floor. They also highly value their involvement in communicating with the family, caring for critically ill patients and being an advocate for patient's wishes once they are declared brain dead. They identified their most challenging roles as donor management, being involved in securing consent to donation and collaborating with physicians. There are times when these roles seem to conflict with each other and as one nurse said "you want to do all the right things for all the right people, and sometimes what's right for one isn't right for the other". Another nurse concurred, she described feeling like she had to be "a gumby doll and stretch and stretch and know what every single person wants to hear at every given time".

Nurses consistently voiced the assertion that the proactive nurses are the

ones who really keep the organ donor process successful. "It is the nursing staff that has to initiate it and keep it going"; "it almost feels like it's all on us. If there is a *(donor)* potential we have to be the aggressive voice, staying on top of it and making sure all the other people are on the same page", and "many of our surgeons and docs never say call the OPO. It's kinda left up to the nurses' discretion when to call".

Working with Physicians: Nursing Authority and Autonomy in ODP

The previous statements are just a few that represent the recurrent idea among critical care nurses that less-experienced peers (*nurses*) who don't know what is expected of them, and/or nurses who have never been through a donor case, and/or nurses who are insecure about their own skills are less likely to initiate the organ donor process. "We have a lot of new staff and they are so self-conscious about… their bedside skills. Let alone the savvy it takes to approach families". These statements also reinforced the nurses' sentiment that physicians are not involved enough in the ODP beyond the specific task of declaring a patient brain dead. "The problem is when they *(physicians)* are ready to give up they are ready to give up right then and there and they are ready to stop when they say enough *(treatment)* is enough and it doesn't give you time to organize anything". It gets to the point in many situations where "once the declaration of brain death has been made the physicians kind of back away completely from this whole process". "The doctors feel that once the patient is brain dead they shouldn't have any more involvement in it". This attitude is quite off-putting to many nurses who would prefer to see physicians more actively

support the organ donor process by actively encouraging health care professionals and peers to consider organ donation from the time a critically brain injured patient is admitted to the unit, at least up until the family has been approached to request consent.

Even physicians who are not opposed to organ donation can be resistant or downright upset at nurses who call the OPO "early" or who broach the topic of donation with families before the physician is ready to "give up". One nurse recounted a story in which she was chastised for calling the OPO prior to the physician declaring brain death. He thundered, "how dare you, how dare you!" Nurses face conflicts between their authority and autonomy when dealing with the ODP. The physician must be given the diagnostic respect to be the one to determine when a patient should be declared brain dead but nurses feel that there is much to be said for getting the OPO involved early so that if, and when a patient is pronounced things can flow smoothly. The nurses will be less overwhelmed by the myriad of things that need to be accomplished once the organ donor process is initiated.

Nursing Caseload and the ODP

The challenging nature of nurses' roles in the ODP is further supported by a nurse's reality that he/she may "spend more time taking care of a dead patient compared to somebody in the next bed who is probably going to get out of the unit". The donor management process is very time consuming, "a lot of times the OPO patient is not a one-to-one" they still have other patients to take care of". This extended staff workload can become particularly difficult for both the

assigned nurse as well as his/her nursing peers who must pick up the slack in coverage. Taking care of a donor case is also emotionally difficult for all the nurses and they often find it difficult to make the transition between caring for a critically ill patient to simply maintaining the viability of organs of someone they have become attached to, “it’s so sad and its hard…I do what I have to do to take care of the patient but it’s just hard. It’s hard to watch”.

There are often times when nurses don’t know if a patient is an organ donor and it is difficult to determine if their effort to prepare them for being a donor is futile or even contrary to the patient’s wishes. Not knowing a patient’s donation status is exacerbated by the idea that many nurses and even physicians feel that the family’s grief at that time makes them particularly non-receptive to the idea of organ donation. One nurse characterized the families as “confused” because they are being told that their loved one is dead but there are still vital signs on the monitor. This incongruence seems to create an even greater conflict of interest when the critical care nurse and physician are involved in requesting consent to donation.

Working with the OPO in the ODP

With very few exceptions nurses seemed to appreciate the OPO role as the entity that coordinates clinical orders, lab work, paperwork and scheduling. They value the OPO’s role of taking the time to explain the entire process of brain death and organ donation to grieving families who are often “still in quite a state of denial and…there is a wall they put up if we mention certain things”. The OPO hospital development staff and procurement nurses who are discharged by

the OPO are charged with determining donor eligibility, securing consent from the family and coordinating organ recovery. Nurses described the relationship between the OPO staff and the hospital nurses as one of cooperation and collaboration. With the OPO involvement nurses no longer have to squarely face the popular misconception that they are "hungry for their *(loved one's)* organs". "They make it painless". Most nurses had positive impressions of the interactions between the two groups. In fact a general consensus was "we all work pretty well together…we have a really good relationship with them. They cooperate and we collaborate". The OPO role was described by nurses as being mainly a coordinating agent and the ones who are specially trained to secure consent to donation from families.

The relational challenges to the interactive coordination between the OPO and the nurses are often related to perceptions of ownership and entitlement as well as burdensome time commitments. The OPO staff is not often given a workspace within the unit. This results in a tense "takeover" where the patient records, telephones, desk space, lunch room, unit secretary, and even knowledgeable nurses are appropriated for use by the OPO staff often at the expense of all the nurses on the unit. This creates stifled tensions as individuals jostle for tangible and intangible resources.

On the other hand, there are also a few of the more confident and assertive nurses who felt that nurses should be more integrally involved in requesting consent to donation. Throughout the patient's illness the bedside nurse is "there all the time with the families so we have an emotional attachment

to them. We get really involved and know everything that is happening". This small subset of nurses felt that the entire donation process, and the families in particular, are better served if the health care providers with the most interaction with the patient and the family are able to portray a more compassionate request for consent to donation, compared to the OPO who only becomes involved with the families once the patient expires. One nurses declared that he thought the outcomes *(for consent)* would be better if nurses were more involved in communicating with the families about organ donation but, "the OPO takes over. They are the ones that say we will do the communication". Current legislation allows hospitals and their OPO to independently decide *who* approaches the families for consent to donation and *when*. In this hospital system the decision has been made to allow the OPO to make the initial approach at their discretion.

Programmed Coordination

Commitment to the clinical protocol in the ODP

The clinical pathway of organ donation previously diagrammed, which includes the clinical protocol for brain death declaration, and the federal guidelines for reporting a brain injured patient to the OPO, are the two examples of programmed coordination that are relevant to this study. These are specific well-documented guidelines that health care professionals are expected to adhere to in order to support a successful organ donor process. Nurses described themselves and most of their nursing peers as committed to the organ donor process. The ODP works well in some hospitals because they have

"several nurses who are excellent at recognizing and getting the OPO involved in a timely fashion. They are like the trendsetters". These are the nurses that "understand their role."

Team Education and Performance in the ODP

Nurses' perceptions as to how relational issues enhance or impede these elements of programmed coordination were not numerous. When discussing the interplay between programmed coordination and relational coordination issues it was again evident that there was only minimal buy-in to the idea that all the clinical groups who enact this clinical protocol are part of a team. As such, the prevailing sentiment was that each clinical group is responsible for educating themselves on the clinical guidelines/organizational protocols, and that the OPO is also responsible for initiating and managing any in-services that may bring members of all the functional groups together for training. In their opinion, the OPO is responsible for making all the functional groups involved aware of changes in protocols, rules and federal requirements in a timely manner. This is in contrast to the idea that clinical groups that work together as a team on common processes can benefit immensely from team-directed learning and continuing education. Nurses identified training, training and more training as the best way to make all clinical groups aware of the existing protocols and how they are to be enacted not just by their peers but also by other clinical groups. One nurse stated "if you don't have the skills to do what is needs to be done at the moment we know how to research it". They expect other clinical groups to be just as proactive in keeping up with the expectations of the ODP.

Most of the education that was proposed was not directed at enhancing the clinical skills and technical knowledge of health care professionals. Instead it centered on making health care professionals more aware of the dictates of the clinical pathway of organ donation. More than a few nurses stated that "further education among the…house officer physicians, maybe even some of the nursing staff that work with the house officers that aren't accustomed to or even comfortable with doing some of the initial procedures" would improve how the process works. In reference to physician support of the ODP several nurses expressed the sentiment that if physicians were "more aware of the protocol… it would make it a lot easier and a lot less animosity for calling", and that health care professionals need "more education as to what to expect, and I am not just talking about the new nurses. I am talking about some of the physicians…and people that are managing the units". In this way issues of professional authority and autonomy in the ODP and the attendant tensions could be minimized.

Brain Death Protocols

The issue of disparate opinions on the brain death protocols is a little more challenging to address. Physicians have the diagnostic authority to declare brain death, to determine when further treatment of a critically brain injured person has become futile. However, while there are some protocols to guide the brain death decision, even clinicians within the same institution sometimes disagree on when brain death has actually occurred or more importantly when to end treatment. Nurses are in a position to see this disagreement first hand as they must provide appropriate care based on physicians orders. The situation is particularly

challenging in instances where there seems to be a shift from the technical consideration when a specific threshold for brain death has been met to a more personal and emotional one of when the physician and/or nurse has reached the point of being willing to "let go".

Compounding this issue is the emotional conflict embedded in the idea that declaring brain death or calling the OPO is "giving up". Both nurses and physicians are often wary of the misperception that being supportive of organ donation is "giving up on taking care of my patients, or making sure that if there is a chance of them getting better that I am not going to take that chance". Nurses who face resistance from physicians about early OPO involvement believed that "they (*physicians*) almost feel like they are being turned in or being deemed a failure" because they couldn't save a patient from death. Some nurses recognized that families may also contribute to this sense of professional conflict if they are members of communities or subcultures where organ donation is not well-accepted. Their recommended resolution to this problem - community education - is outside the immediate purview of the hospital system but can be accomplished via the media, primary care physicians and first line hospital staff who may interact with families intermittently even prior to traumatic events.

Hospital Characteristics and the ODP

Hospital characteristics can also impact the way the organ donor process is enacted a hospital. A hospital that serves very few trauma patients or one with limited resources such as limited access to a neurologist, anesthesiologist, surgical team, or respiratory technicians, is less likely to be able to successfully

initiate and maintain the ODP if an opportunity arises. Many nurses reported working in units at night or over the weekend hours where there is limited access to on call medical staff who facilitate the ODP. In one hospital there is only one person in the entire building who can do an electroencephalogram (EEG), “if she is not in or if she is on vacation it is a horrible fight to get someone or to get someone from another hospital system”. In yet another interview a nurse lamented that, “our physicians aren’t great about coming in the middle of the night to pronounce somebody brain dead...They honestly don’t come in until nine in the morning and then they go see all their other patients who are viable and then come to the patient that is brain dead”.

Issues such as this may not be resolved at the unit level with a nurse manager, but taken to a higher authority within the organization that can compel other department heads to ensure the support of their team members. A resolution through the bureaucratic process can weeks. “A number of times it’s been serious. It takes two weeks and we don’t find out, then it could be a frightful problem”.

This study was able to tease out many relevant ideas which answered the research questions posed. There are several aspects of interpersonal relationships that were deemed important to the organ donor process by critical care nurses. In summary they included:

- It is most important for critical care nurses to retain their role as advocate for the patient and the family.
- Critical care nurses should be allowed and encouraged to be proactive in

the organ donor process by their peers, nursing administration, physicians and members of other functional groups

- Experienced critical care nurses should mentor newer nurses, giving them the confidence and experience needed to become comfortable with the expectations and challenges of the organ donor process.
- There needs to be a greater emphasis on having congruent goals between all functional groups involved in the ODP. This is not limited to the overarching goal of increasing donation rates but the smaller work processes that facilitate the larger goal.

The aspects of interpersonal communication that are deemed as important to the organ donor process by critical care nurses are:

- Critical care nurses would prefer a more collaborative relationship between nursing and physicians. One in which the physician's role in the ODP is extended beyond simply declaring brain death, to one where possibility of organ donation is candidly discussed in a timely manner.
- The OPO and individual hospitals need to be more visibly involved in the dissemination of information on; new or existing protocols/rules and responsibilities of ALL the functional groups involved in the organ donor process. This likely would translate into fewer repercussions and tensions when nurses do what they are expected to do in the ODP.

In general nurses although nurses seemed resigned to the status quo, they did not think that the first four nodes of the organ donor process are consistently adhered to. Critical care nurses noted that:

- Were it not for proactive nurses many important things in the organ donor process would just NOT happen. On a regular basis many nurses must go above and beyond basic expectations to initiate and sustain the organ donor process.
- Many members of other functional groups just do not give the organ donor process a high priority. They do not adeptly balance their personal needs/opinions and the needs of other critically ill patients with the need to facilitate a successful organ donor process.

The aspects of the organ donor process which seem to be most affected by shortcomings in relational, interactive and programmed coordination are:

- The timeliness and efficiency of brain death declaration, particularly on nights and weekends.
- The ability of critical care nurses to balance donor management with their critical care patient load.

The relationships between unit staff and the OPO when the immediate resource needs of an eligible donor disrupt the flow and functioning of a critical care unit.

Chapter 18

Discussion

Relationship-intensive Coping Strategies in Interactive Coordination

For the most part the nurses interviewed were supportive of the organ donor process but find that it is extremely challenging and emotionally draining to be involved. It is apparent that they have developed relationship-intensive coping strategies of their own to deal with the inadequacies in interactive coordination that exist in their hospitals relative to the ODP. The ways that they reduce the ambiguity, tensions or stresses in their relationships when dealing with the challenges of the ODP are an indication of the areas that require attention by hospital administrators. One of the premier complaints was the inordinate work load that ensued once a patient was identified as a potential organ donor. The patient-nurse ratios, the clinical requirement of donor management, the paperwork, and the attitudes of others clinical groups involved in the OPO presented quite a few challenges. In order to deal with this, nurses' first line of support is other unit nurses who help pick up the slack even though they are not required to do so. They administer care to additional patients, make calls and provide reminders if the bedside nurse becomes overwhelmed with patient care both prior to brain death declaration and after.

Another supportive group of health care professionals in some hospitals is the OPO procurement nurses. They are versed in donor management and

sometimes may offer hands-on support to the bedside nurse by drawing blood labs, managing vents, and liquids. Some nurses consistently choose to call the OPO early to make them aware there is potential for an organ donation on the unit. This allows the OPO to determine initial eligibility and get several things in place so that if and when the person is declared brain death the bedside nurse is less overwhelmed with the myriad of things that need to be assessed.

Throughout the many US health systems, the organ donor process has been designed as an interdependent process between various functional groups. Interestingly most nurses interviewed did not place a high level of importance on the need for interdependence between the groups, although they did classify the organ donor process as a team effort. This may be due to the disparate frequency and level of interaction between nurses and other functional groups. For the most part nurses interact primarily with other nurses, nursing administration, and the organ procurement organization in order to facilitate the organ donor process. They also see the process as serviceable with or without the complete support of the other functional groups identified. In instances where it is both necessary and difficult to obtain the expedient contributions of other functional groups, particularly physicians, the bureaucratic procedures that may be used could take weeks. In the meantime, the organ systems of a potential donor may be irrevocably damaged and viable organs lost. This lack of team mentality impacts the process in ways which may be evident in many circumstances but difficult to quantify.

Finally, nurses find ways to deal with the negative perception of donation by seeking out a more experienced nurse to assist them and by using euphemisms for the OPO when talking about organ donation on the unit. They can make the necessary decisions and set things in play for organ donation without alerting too many persons. "It doesn't take much to make a call and if you're wrong no harm is done. But if you're right then… it gives everybody, the OPO, the family, and all the medical staff... adequate time to collaborate all this stuff… so that together you can really do a lot of good from it".

Relationship-intensive Coping Strategies in Programmed Coordination

In comparison to interactive coordination, there is less that nurses report doing that can be described as ways to bridge the shortcomings in programmed coordination. The issues of professional authority, professional autonomy, professional respect, and influence within the health care system, limit nurses' ability to mitigate the most troubling aspects of the way the clinical guidelines for organ donation are met in their hospitals. The quality of organ donor process often suffers from the internal conflicts and territorial boundaries defended by nurses, physicians, the OPO, and hospital administrators. Ever so often health care professionals who are adept at analyzing situations, exercising care, discretion and judgment don't know how to interact considerately with other health care professionals with whom they work (Cathon and Brownson, 2000).

Clinical protocols are the norm in the hospital setting and individual familiarity with a myriad of protocols is important to the smooth flow of the various

clinical processes. One way for health care professionals to be thoroughly familiar with the protocols relevant to the organ donor process is through professional education, personal experience and self-directed learning. Where this is lacking it may manifest as incongruent attitudes and goals. One way to reconcile disparate attitudes and goals among health care professionals involved in the organ donor process is to continually improve their knowledge and skill set through education activities, professional activities, sharing knowledge with other health care professionals and seeking to always be on the cutting edge of new and innovative aspects of professional practice (Cathon and Brownson, 2000).

Nurses educate themselves, “getting information if I don’t already have it”. They are a source of information for families, “answering or getting answers for them”. They often involve the OPO as an ally (not just a team member) in the process, “if the (families) ask us something absolutely we can answer them but we refer them to the OPO”, “we facilitate the OPO’s interaction with the family”. Finally they support each other when a successful organ recovery has occurred.

Implications for Future Research

The conversations about the way existing communication modalities and interpersonal relationships facilitate or impede the organ donor process in this health system were very informative. This study is by no means and exhaustive treatment of the subject, but instead provides invaluable insight into the experiences and opinions of critical care nurses who are in the forefront in initiating and sustaining organ donation within their hospitals. The Theory of

Relational Coordination provided a very informative framework with which to start the constant comparative method of theory elaboration. One salient area for further theory development among critical care nurses in organ donation is the idea of coping strategies. These represent the intra-personal and peer-to peer actions that nurses engage in not simply to facilitate interactive and programmed coordination activities, but more importantly to bridge shortcomings where formal communication and relational structures either, do not exist or fail to perform as expected.

The theory of relational coordination focuses primarily on how the interpersonal relationships and communication between functional groups which facilitates quality service to their clients. However, in the health care context, this study found that the interpersonal relationship and communication between the critical care nurse and the donor patient and his/her family seemed to be a premiere driving force behind nurses' willingness to initiate and sustain the ODP even without adequate internal support or organizational resources. An area of theory elaboration and future research would be to include the role of the relationship between the health care professional and the patient in facilitating the organ donor process. This may include assessing the impact that patient expectations, professional obligations to the patient, eliciting empathy or sympathy and image management with the hospital may have on compelling health care professionals to participate in the ODP.

Another area of future research will be to replicate this study among nurses in other health systems with donor-transplantation hospitals. However,

prior to this, there is also much to be gained by replicating this study among physicians in this health system. Their prominence and authority in the organizational hierarchy and their narrowly defined roles and responsibilities in the organ donor process are likely to produce a significantly different experience with the organ donor process. The opportunity to compare and contrast different shades of meaning that nurses and physicians bring to the same process is one that bodes well for our ability to; help different groups understand each other, improve the entire organ donor process and increase opportunities for organ donation through the health system

Implications for Policy Delivery or Practice

One issue that this study confirmed was the fact that often there is no single person or group of persons charged with the responsibility of making sure the organ donor process functions as it was designed. This lack of oversight and accountability makes it more difficult to identify and resolve both individual and organizational failures when potential donors are missed. Bedside nurses seem to feel especially responsible for the effective enactment of the organ donor process within their hospitals, but also lack the professional autonomy and influence to compel other functional groups to contribute to the organ donor process.

A qualitative study such as this one not only provides a rich description of the opinions and experiences of critical care nurses, but also serves to give nurses a voice in improving the organ donor process within their hospital. Giving

"voice" may be empowering to nurses who are apt to feel as though their contributions and the extent of the challenges they surmount are not fully appreciated.

The interviews were very informative in identifying strengths and weaknesses in the work processes carried out by interdisciplinary teams involved in organ donation. This study can serve as an invaluable resource for administrators and health care professionals who seek to successfully improve clinical models, ensure the development of effective interdisciplinary teams, and improve coordination of organ donation within and between health care organizations.

Limitations

Several limitations of this study are worth taking note of:

1. The key informant methodology used to select participants for interviewing has some unique limitations. First differences related to individuals' varying roles or experience in the organization can result in informant bias because specific organizational roles and/or experiences influence interpretation of events. Second, more idiosyncratic sources of error such as memory failure, hindsight bias, social desirability biases, and impression management can taint health care professionals' accounts of the organ donor process (Huber and Power, 1985 and Salancik and Meindl, 1984). However, according to Gittell (2002b) the technique of asking respondents to describe their

interactions with functional groups rather than individuals may ameliorate some of the potential for sources of biases.

2. Organ donation is a relatively infrequent event in the health system. As a result the interviews conducted as part of this study are retrospective by design. Therefore responses may be influenced by yet another bias - recall bias on the part of respondents who may not recall accurately all aspects of their involvement with the organ donor process.
3. Health care professionals who participated in the semi-structured interviews were not a representative or random sample of individuals employed in the health system. While random selection is not a necessary requirement of a qualitative study such as this one, we do recognize that the results and conclusions are limited to a similar sample of critical nurses in similar work environments. Participation was voluntary and no incentives were offered to respondents prior to their participation. As a measure of gratitude two participants from each hospital were randomly selected to receive a gift card.
4. This study is a small scale study conducted in a hospital environment with severe time limitations and accessibility to staff. As such the interview process was constrained to less than 1/2hr and all avenues of discussion could not be pursued extensively.

Chapter 19

Conclusion

This multiple paper study was designed to provide insight on ways to take the model for a successful organ donor process from simply being a professional obligation "imposed" on staff, to a professional standard that benefits from large scale buy-in from health care professionals at all levels of the health system. There is a greater need to understand the diverse motivations, experiences and perceptions which influence health care professionals' participation in the organ donor process (ODP). The combination of qualitative and quantitative research methods provides a range of analytical tools to assess the relevant issues from various theoretical angles. Each conceptual or theoretical framework tapped unique constructs related to how the ODP is enacted and experienced by those health care professionals most likely to be involved in the process. More importantly, as a group these studies provide ample confirming evidence for the need for multiple or meta- theoretical approaches when initially assessing individual behavior particularly in an organizational context. There are also a number of areas of overlap which confirm and reinforce the findings throughout all three studies. I will address these areas of overlap below.

First, these studies confirm the concept that attitude to organ donation and the organ donor process (ODP) is a multi-dimensional construct. Five individual constructs were identified that captured health care professionals' attitudes to the ODP and organ donation, as well as attitudes related to their ability to access the

tangible and intangible organizational resources which facilitate their involvement in the ODP in their health system.

Two important sets of attitudes among health care professionals include: 1) attitudes related to collaboration with the organ procurement organization, and 2) perceptions of disconnect in attitudes to organ donation and/or the organ donor process between health care professionals representing different functional groups. It was also found that socio-demographic and organizational related characteristics are relevant and health care professionals are more supportive of the ODP when there was both individual and organizational willingness to participate in the ODP and a perception of organizational support.

These finding reiterate the idea that health care professionals may not lack the technical skills to enact the ODP, but their consistent involvement may be more likely influenced by their attitudes. And, these attitudes represent a myriad of social and organizational enabling factors.

Second, this group of studies explores the predictive power of attitudes in the organ donation context, specifically, behavioral intention to participate in the organ donor process (ODP). The predictive relationship is expanded to include subjective norms and perceived behavioral control, two other antecedents of behavioral intention. As hypothesized by the Theory of Planned Behavior the relationship between these constructs was positive however, only attitudes and perceived behavioral control were also significant. This is bolstered by the findings in the qualitative study of relational coordination which indicate that when critical care nurses are committed to the organ donor process they develop ways

to initiate and sustain the process even when there is minimal organizational support, lack of peer support, or other difficult circumstances.

Attitude to the organ donor process is by far the best qualitative and quantitative predictor of behavioral intentions. Health care professionals' intentions to participate in the ODP is more a function of their personal attitudes and ability to choose whether they participate in the ODP, than it is a function of the social norms that may exist in their health system to pressure them into being involved or not involved in the OPD.

The inclusion of a qualitative paper in this group of studies added significant richness and voice to the findings of the previous studies. The interviews with the nurses provided an opportunity to identify many of the factors at work behind the quantitative conclusions which point to areas of deficiency in the organ donor process. This particular study highlighted many areas in which interpersonal relationships and communication either enhanced or impeded nurses' ability to participate in the organ donor process. The open dialogue also allowed nurses to highlight the many relationship-intensive coping strategies that they employ in order to bridge shortcomings in the coordination of the ODP.

Third, these three studies highlight the rich research tapestry that can be constructed from diligently applying a variety of research methodologies to a single issue. These studies utilized methodologies and theoretical concepts which are readily accessible and translatable to health care professionals and health care administrators interested in improving the clinical protocols within their hospital or health system.

In order to improve organ donation and the organ donor process there needs to be a greater emphasis on identifying the factors driving the consistent shortcomings of current organ donation and transplantation processes. The first step in this quest is to quickly identify the areas that are inadequate, then to accurately determine what is driving and sustaining these inadequacies and finally to design agendas which address the relevant issues from an informed perspective. When this happens consistently through the US then perhaps the health care system will witness a narrowing of the gap between the demand for cadaveric organ and the suitable organs available for transplantation.

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Appendix A

Semi-structured Qualitative Interviews

1. As best as you can, identify your assigned role/roles in the organ donor process (ODP)? (*Read phases and show overview or diagram of the ODP*)
    - ☐ Donor identification
    - ☐ Donor referral
    - ☐ Brain death declaration
    - ☐ Donor management
    - ☐ Professional education
    - ☐ Consent process
    - ☐ Family liaison / Bereavement support
    - ☐ Other_____

2. What other tasks/roles do you perform in the organ donor process? (*Refer to diagram of ODP*)
    - ☐ Donor identification
    - ☐ Donor referral
    - ☐ Brain death declaration
    - ☐ Donor management
    - ☐ Professional education
    - ☐ Consent process
    - ☐ Family liaison / Bereavement support
    - ☐ Other_____

3. Do you feel proficient at performing your tasks/roles in the organ donor process?

    ___Yes ___No ___Uncertain

    Please explain your answer. why? /why not?

4. Who are some of the persons (occupational/functional groups) you work with to accomplish your tasks related to the organ donor process?

    - ☐ Neurologist/Neurosurgeon
    - ☐ Nurses
    - ☐ Intensivists

☐ Respiratory therapists
☐ Social workers
☐ Pastoral Care/Chaplaincy
☐ OPO Representatives
☐ Hospital Administrator
☐ Other participant groups _____

5. In general, how **frequently** do you communicate with other members of the organ donor team on a typical organ donor case? (*Read each group to participant*)

	Not applicable	Never	Rarely	Often	Constantly
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which this **frequency** of communication is sufficient for you (and other members of your functional group) to MOST efficiently perform your roles. Would you say, the frequency of communication is:

0 – not applicable/necessary 1 – Woefully insufficient 5- Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

6. In general, how **accurate** is the information provided in communication between you and other members of the organ donor team on a typical organ donor case?

	Not applicable	Never accurate	Rarely accurate	Often accurate	Always accurate
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					

OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which the **accuracy** of information communicated is sufficient for you (and other members of your functional group) to MOST efficiently perform your roles. Would you say the accuracy of information is:

0 – not applicable/necessary 1 – Woefully insufficient 5 - Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

7. In general, how **timely** is the communication between yourself and other members of the organ donor team on a typical organ donor case?

	Not applicable	Never timely	Rarely timely	Often timely	Always timely
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which the **timeliness** of information communicated is sufficient for you (and other members of your functional group) to MOST efficiently perform your roles. Would you say the timeliness of information is:

0 – not applicable/necessary 1 – Woefully insufficient 5 - Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

8. In general, how often do other members of the organ donor team work with you to **resolve any challenges/problems** faced on a typical organ donor case?

	Not applicable	Never	Rarely	Often	Always
Neurologist/ Neurosurgeon					
Nurses					

Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which the opportunities for **problem-solving** provided within the organ donor team are sufficient for you (and other members of your functional group) to MOST efficiently perform your roles. Would you say the opportunities for problem-solving are:

0 – not applicable/necessary 1 – Woefully insufficient 5 - Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

9. In general how **knowledgeable** are the other members of the organ donor team about your unique role/s in a typical organ donor case?

	Not applicable	Nothing	Very Little	Quite a bit	Everything
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which the level of **knowledge** among members of the organ donor team regarding your role/s in the organ donor process is sufficient for you (and other members of your functional group) to MOST efficiently perform your roles Would you say the level of knowledge is:

0 – not applicable/necessary 1 – Woefully insufficient 5 - Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

10. How would you describe the level of **interdependence** (*define*) that actually exists between your role/s and the role/s of other members of the organ donor team who carry out a typical donor case?

	Not applicable	No inter-dependence	Minimal inter-dependence	Moderate inter-dependence	High inter-dependence
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which this level of **interdependence** between practitioners is sufficient for you (and other members of your functional group) to MOST efficiently perform your role/s in the organ donor process. Would you say this level of interdependence is:

0 – not applicable/necessary 1 – Woefully insufficient 5 - Totally sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

11. In general how much would you say the other members of the organ donor team **support** your role on a typical organ donor case?

	Not applicable	No support	Very Little support	Some support	Totally supportive
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which this level of **support** is sufficient for you (and other members of your functional group) to MOST efficiently perform your roles. Would you say this level of support is:

0 – not applicable/necessary 1 – Woefully insufficient 5-Totallysufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

12. How clearly defined are your hospital/department/unit goals, objectives and expectations for delivering a successful organ donor process?

0 –No known goals 1 – Ill-defined 5–Clearly defined

0 1 2 3 4 5

Do you share these goals? Why? / Why not?

13. In general to what extent do other members of the organ donor team **share** the same **goals** for handling a typical organ donor case?

	Not applicable	No Shared goals	Few shared goals	Several shared goals	Many shared goals
Neurologist/ Neurosurgeon					
Nurses					
Intensivists					
Resp. Therapists					
Social Worker					
Pastoral Care					
OPO					
Hospital Administrator					

On a 5-point scale, rate the extent to which the **goals** that <u>are</u> shared allow you (and other members of your functional group) to MOST efficiently perform your roles. You would say that the extent to which goals are shared is:

0 – not applicable/necessary 1 – Woefully insufficient 5-Totally Sufficient

0 1 2 3 4 5

What makes it work well? How can it be improved?

14. One of the things that make interdisciplinary teams work efficiently is the ability for members to be very aware of what other team members do and even fill in for them if the need arises. However, clinical specialties, skills, and coordination between units are usually standardized or programmed guidelines for each member of the team. With respect to the roles that you are able to perform, do you think the scope of your specifically assigned roles impede or enhance enactment of organ donation in your hospital?

A VITA

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